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### CONTENTS AND SUBJECT INDEX

Advances in Anesthesia from Standpoint of the Surgeon. Frank H. Lahey, M.D., Boston.....959

Respiratory and Circulatory Changes During Spinal Anesthesia. M. H. Seevers, M.D., and R. M. Waters, M.D., Madison, Wis.....961

Advances in Anesthesia from Standpoint of the Anesthetist. John S. Lundy, M.D., Rochester, Minn..968

Papers of Dr. Lahey, Drs. Seevers and Waters and Dr. Lundy discussed by Drs. Halsey, Judd, Caine, Trusler, Seevers and Lundy.

Industrial Dermatoses with Special Reference to Allergy and Mycotic Dermatitis. Earl D. Osborne, M.D., and Edwin D. Putnam, M.D., Buffalo .....972

Discussed by Drs. Lane, Alderson, Foerster, Michael, Hollander, Shelmire, Anderson, Weidman, Cole, Lain and Osborne.

Significance of Immunity Tests in Epidemiology as Illustrated in Yellow Fever. T. P. Hughes, Ph.D., and W. A. Sawyer, M.D., New York.....978

Discussed by Drs. Lloyd, Jungeblut, Mohr and Sawyer.

Principles of Treatment in Common Arterial Diseases of the Extremities. W. J. Merle Scott, M.D., and John J. Morton, M.D., Rochester, N. Y.....982

Discussed by Drs. Matas, E. V. Allen, A. W. Allen, Adson and Scott.

The Tranquilizing Potency of Morphine, Pantopon, Codeine, Papaverine and Narcotine: Results of Tests on the Rat. O. W. Barlow, Ph.D., Cleveland.....986

Carbon Tetrachloride Poisoning. L. W. McGuire, M.D., Boston....988

Subdural Hematoma in Infantile Scurvy: Report of Case with Review of Literature. B. Barrett Gilman, M.D., and Radford C. Tanzer, M.D., Rochester, N. Y..989

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Hemophilia: Prevention and Treatment of Bleeding with Ovarian Extract. H. T. Kimm, M.D., and C. M. Van Allen, M.D., Peiping, China .....991

Observations on a Patient to Whom Spinal Anesthesia was Administered Five Times Within Thirty-Eight Hours. William M. Sullivan, Jr., M.D., New York.....993

COUNCIL ON PHYSICAL THERAPY 994

COUNCIL ON PHARMACY AND CHEMISTRY 996

COMMITTEE ON FOODS 996

EDITORIALS

Nature of Protein Solutions.....998

The Correlation of Blood Dyscrasias on the Hypothesis of Bone Marrow Deficiency .....999

"Virulence Cycle" in Epidemics.1000

CURRENT COMMENT

The Content of Cholesterol in the Blood .....1000

(Subject Index on next page)

ASSOCIATION NEWS 1001

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# SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics.


Abadie, Charles, death....1006
Abscess, perinephric, diagnosis....ab-1039
Acid-producing foods and purines....1014
Albuminuria after exercise....ab-1023
American Committee for the Control of Rheumatism, work....ab-1020
Amyoplasia congenita....ab-1032
Amytal, sodium, in psychoses....ab-1030
Anaphylaxis, industrial dermatoses....*972
specific sensitivity....1015
Anemia, hyperchromic, in chronic pancreas disorders....ab-1039
Anesthesia, advances in....*959; *968
spinal, given 5 times within 38 hours...*993
spinal, prognostic value....ab-1033
spinal, respiratory-circulatory changes in.*961
Angina, Vincent's, with diphtheria....1008
Angina Pectoris, treatment....ab-1028
death from....1014
Animals, neuroses in....C-1012
Arthritis and cholecystitis....ab-1021
chronic, desensitization treatment....ab-1021
chronic, vaccine therapy....ab-1022; ab-1024
digestive tract and....ab-1020
endocrine disorders and....ab-1020
in ex-service men....ab-1020
pyogenic, relation to osteomyelitis....ab-1031
streptococcic, experimental....ab-1026
Asbestosis body....ab-1035
**Association News....1001**
Atrophy, muscular, neurogenous form..ab-1042

Bedbug infestation....1015
Biology of human nature....1006
Blood, cholesterol content....E-1000
circulation, femoral, vs. lumbar sympathectomy....ab-1023
circulation in obesity....ab-1027
circulatory changes during spinal anesthesia....*961
dyscrasias, correlation of....E-999
pressure, high, and diabetes....ab-1025
sugar, low, after irradiating pancreas.ab-1040
types in paternity cases....ab-1042
uric acid in disease....ab-1027
Blumenthal, George....1006
Bone Marrow deficiency....E-999
**Book Notices....1017**
**Books Received....Adv. page 30**
Brain tumor, Kehrer's sign in....ab-1039
peptic ulcers and interbrain....ab-1031
Bronchiectasis, chronic....ab-1028
**Bureau of Investigation....1012**

Capillary wall during venous congestion....ab-1027
Carbon Monoxide poisoning, pseudodementia paralytica after....ab-1036
Carbon Tetrachloride poisoning....*988
Chamberlain, H. E....1003
Child Guidance work, University of Chicago....1002
Children's clinics in physicians' offices....1002
examination, Baltimore....1002
Clavicle, fracture....1015
Codeine, tranquilizing potency....*986
Colon, studied by double contrast enema....ab-1024
**Committee on Foods....996**
Conference on Rheumatic Diseases....1020
**Correspondence....1012**
**Council on Medical Education....1016**
**Council on Pharmacy and Chemistry....996**
**Council on Physical Therapy....994**
Cranium, depressed fractures of vault..ab-1032
Curtis, George M., goes to Ohio State....1002

**Deaths....1010**
Dementia Praecox, hemato-encephalitic barrier in....ab-1041
Dermatitis, contact test for specific sensitivity....1015
from wrist watch....1006
Diabetes Mellitus, effect of pregnancy..ab-1029
fallacy of weighed diet in....ab-1025
hypertension and....ab-1025
Diarrhea, summer, "slow dulcite fermenters" in....ab-1035
Digestive Tract, relation to arthritis...ab-1020
Diphtheria, immunization against....ab-1031
Vincent's angina coexisting with....1008
Disease, blood uric acid in....ab-1027
general, reactions of eye to....ab-1034
Dogs, facial tic in....1015
Duodenum, deformities....ab-1036
Dysentery bacillus, "slow dulcite fermenters"....ab-1035
Dyspepsia, indigestion....ab-1036

Eggs, hard, soft-boiled and raw, digestibility....1014
standardization, campaign to enforce....1001
Embolism, fat....ab-1025
Endocrine disorders, relation to arthritis.ab-1020
hyperglycemia and....ab-1037
Epidemics, "virulence cycle" in....E-1000
Epinephrine and sympathetic vasodilators....ab-1034
Ergot preparations, action on puerperal uterus....ab-1033
Exercise, albuminuria after....ab-1023
Extremities, common arterial diseases....*982
diseases, spinal anesthesia in....ab-1033
Eye reactions to general disease....ab-1034
"specialists" foiled....1002

Femur, fractures of neck....ab-1025
Fingers, infections of....ab-1035
Food poisoning, moldy food in....1015
expenditures for, in workmen's families.1007
Foot, minor ailments....ab-1036
**Foreign Letters....1005**
Fractures, treatment....ab-1033

Gallbladder inflammation and chronic infectious (atrophic) arthritis....ab-1021
Gonorrhea, persistent complement fixation and cure....ab-1037
Gore, J. E., sentenced....1004
**Government Services....1005**

Hands, infections....ab-1035
Harvard University, fall graduate courses.1002
Hay Fever, seasonal....ab-1036
Health department reorganization, Maryland....1002
Heat regulation and raw, salt-free diet.ab-1040
Hematemesis, complex origin of....1006
Hematoma, subdural, in infantile scurvy..*989
Hemophilia, ovarian extract (Birch) in...*991
Herniotomy, inguinal, results, in men..ab-1042
Herpes zoster....ab-1029
Histamine as gastric secretion hormone.ab-1023
Hospital, St. Mary's, celebration, Rochester....1003
Human nature, biology of....1006
Hypothyroidism without myxedema....ab-1025

Industrial dermatoses....*972
diseases, reporting....1002
Influenza, induced sweating....1006
Intestine, large, perforating lesions....ab-1028
Meckel's diverticulum, peptic ulcer in.ab-1042

Jellyfish bites, treatment....1015
Joints, amyoplasia congenita....ab-1032

Keen, W. W., death....1006
Kidney, capsules relation to parenchyma.ab-1038
infected, continuous drainage in....ab-1038
surgery, bronze phlegmon after....ab-1038
Knee, flail, operative fusion of....ab-1026

Labor, forceps in, choice of....ab-1029
induction, bougie vs. bag....ab-1027
Lacquers, poisonous, on toys....1013
Leukocytes, filament-nonfilament count.ab-1027
Leukocytosis, physiologic....ab-1034
Leukoplakia oris, rare and new forms..ab-1040
Life tables of mental disease patients...ab-1030
Lightning, death from....1014
Liver, cystic....ab-1039

Malpractice: action in tort no bar to action on contract, when....Ml-1019
**Marriages....1010**
Medical Association of South Africa....1009
Medical Practice Acts: chiropractic as practice of medicine....Ml-1019
**Medicolegal....1019**
**Meetings, Coming Meetings....1020**
Melena, clinical significance of....ab-1028
Meninges, subdural hematoma in infantile scurvy....*989
Mental Disease, life expectancy in....ab-1030
Mycosis, dermatitis....*972

Narcotine, tranquilizing potency....*986
Neck, deep phlegmon....ab-1040
Nervous System, diseases, surgery in, vs. cerebral circulation....ab-1033
Neuritis, ascending, treated by sympathectomy....ab-1037
Neuroses in man and animals....C-1012
**New and Nonofficial Remedies....996**
New York Academy of Medicine Graduate Fortnight....1003
**News....1001**
Nickel, dermatitis from wrist watch....1006

Obesity, circulation in....ab-1027
Ohio State Medical Association, fifth district meeting....1003
Orbit, phlegmons....ab-1042
Osteoarthritis deformans....ab-1026
Osteochondritis dissecans....ab-1026
Osteomyelitis, pyogenic arthritis relation to....ab-1031
Otitis Media, acute, in infancy....ab-1033
Ovary extract (Birch) in hemophilia....*991

Pancreas calculi....ab-1031
disorders, hyperchromic anemia in...ab-1039
irradiation, hypoglycemia after....ab-1040
Pantopon, tranquilizing potency....*986
Papaverine, tranquilizing potency....*986
Paralysis, General, of insane, malaria therapy....ab-1030
of insane, protein shock for....1009
Paternity cases, human blood types in..ab-1042
Peptic Ulcers and interbrain....ab-1031
gastric and duodenal....ab-1035
in Meckel's diverticulum....ab-1042
postoperative....ab-1039
treatment of gastric....ab-1042
Phlegmon, bronze, after renal operation.ab-1038
Physicians, needed, South Africa....1009
Pilocarpine, diaphoresis induced by....1006
Pituitary Extracts, intravenously....ab-1025
Plague infections, laboratory diagnosis.ab-1034
Poliomyelitis, treatment of deformities after....ab-1041
serum, Maine health department wants..1002
Pregnancy, effect on sugar tolerance of diabetic....ab-1029
emulsive tendency of serum....ab-1040
roentgenogram of urinary tract....ab-1041
Protein solutions, nature of....E-998
Psychiatry, practical aspects....ab-1029
Psychoanalysis, course in, New York....1003
Psychoses, sodium amytal in....ab-1030
Purines and acid-producing foods....1014

*Quarterly Cumulative Index Medicus*....1001
**Queries and Minor Notes....1013**

**Radio Program....1001**
Radium-Active Company's remedies not therapeutic....1004
Respiration changes during spinal anesthesia....*961
Rheumatism, American Committee for Control of Rheumatism, work....ab-1020
treatment, climatic factor....ab-1021
Rickets, plasma phosphatase in....ab-1032
Rockefeller Institute, new division....1003

Salt-free diet, raw, and heat regulation.ab-1040
Scurvy, plasma phosphatase in....ab-1032
subdural hematoma in....*989
Sedatives....*986
Serum, emulsive tendency in gestation..ab-1040
nature of protein solutions....E-998
Shelly, S. T., Old Settler's Parade....1002
Shoulder, pulled, or trauma to shoulder joint, treatment....1015
Silicosis in 78 workers in stone....ab-1042
Skin disease, industrial....*972
action of rays on....1005
symptoms in sodium chloride retention....ab-1037
**Society Proceedings....1020**
South African Medical Congress....1009
Speakers' Bureau graduate courses....1002
Specialist, requirements for recognition as, Germany....1007
Spine, tuberculosis of vertebral body...ab-1023
Splenomegaly, significance....ab-1029
Stanford University, Rockefeller Foundation gift to....1001
**State Board Examinations....1016**
Stomach, tuberculosis....ab-1041
secretion hormone, histamine as....ab-1023
Stomatitis, aphthous....1014
Sunstroke, death from....1014
Sweating, induced in influenza....1006
Sympathectomy for ascending neuritis..ab-1037
lumbar, effect on femoral artery circulation....ab-1023
Syphilis, symptomless, in white mice...ab-1038
Wassermann fast....1014

Thornton, Edward, new medical officer of health....1009
Thrombo-Angiitis obliterans, treatment....*982
Tic, facial, in dogs....1015
**Tonics and Sedatives....Adv. page 26**
Toys, poisonous lacquers on....1013
Tubercle Bacillus, three types....ab-1042
Tuberculosis, experimental; nodules of.ab-1024
Tuck, Edward....1006
Typhoid, outbreaks....1004
Typhus group, eruptive fevers of....1009

United Fruit Company, report....1004
Urinary Tract, roentgenogram in pregnancy....ab-1041
Uterus, cancer of cervix, high voltage roentgen therapy....ab-1024
puerperal, action of ergot preparations on....ab-1033
retroversion, Simpson-Gilliam operation for....1014

Veins, congestion, capillary wall during.ab-1027
Viscera, abdominal, fluttering of....ab-1024

Workmen's Compensation Acts: medical treatment; operation, refusal to undergo....Ml-1019

Yeast, uses of....1015
Yellow Fever, immunity tests in....*978
vaccination against....1008
Yew Tree leaves, fatal poisoning....1005

# The Journal of the American Medical Association

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## ADVANCES IN ANESTHESIA FROM THE STANDPOINT OF THE SURGEON


FRANK H. LAHEY, M.D.

BOSTON


It has been my lot to grow up in surgery during the period of the greatest development of anesthesia and of anesthetists. It has been my good fortune to have associated with the clinic, from its beginning, a full-time anesthetist, and to see the department of anesthesia increased until we now have four full-time anesthetists: two physicians and two nurses. This, together with my own natural interest in anesthesia, has provided me with considerable experience, which has in turn permitted me to arrive (at least for my own benefit) at quite definite conclusions.

In my early days in surgery, anesthesia was in a far from satisfactory state. The anesthetic was given by the youngest and least experienced of the hospital interns, who in most instances had had little or no training or instruction in the technic of administration. Responsibility for the anesthesia was claimed or accepted by the operating surgeon, who often impatiently demanded rapid induction, and who dictated the depth to which the patient was to be carried.

The anesthetizing of private patients was done by young surgeons who had recently graduated from surgical house-officerships but who had no operations to do. Giving anesthesia for operating surgeons in private hospitals was accepted as a stepping-stone to higher things in surgery. It kept one in contact with influential surgeons (patronage is not limited to Washington!), and it providentially furnished the income necessary to existence.

So long as anesthesia was limited almost entirely to the administration of ether, this was not a really bad system, supplying, as it did, young men fresh from hospital services with good general training, and assuring them continuation of their association with operative procedures. Its drawback was that these men had no deep and permanent interest in anesthesia: It was to them but a hurdle over which the course led to surgery, an experience to be gotten through with and relegated to the background as soon as possible; and while those who did it wanted to give as good anesthesias as they could, so that they would be asked again and so earn a living, they did not want to be known as too good in anesthesia, lest they become known as anesthetists, and thus be sidetracked from their main object in life—that of surgery.


From the Lahey Clinic.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.


Having personally progressed through the vicissitudes of anesthesia as just described, I became at times acutely aware of the defects of such a system, not only as related to the immediate management of certain trying problems of anesthesia but also as related to the development and advancement of anesthesia. I thought I foresaw that the future of better surgery would be intimately linked with the future of better anesthesia—which all now know to be the case.

The development of anesthetists has therefore interested me very much, and it is through it in recent years that we have seen the extraordinary developments in anesthesia. The plan of the past, under which the anesthetist's responsibility consisted almost solely in putting a patient to sleep and in keeping him there until the operation was over, did not attract the most desirable type of minds to this field. When, however, anesthetists were given actual responsibility and even authority, together with an opportunity to develop and expand their clinical judgment and experience—and when proper remuneration became available—real progress began to appear.

With the development of anesthetists and departments of anesthesia, the progress in anesthesia in recent years has been remarkable, and there has been nothing which has given me greater satisfaction. Nothing else has proved so valuable in the way of facilitating and assuring the safety of surgery.

It would be wrong for me to present a discussion of anesthesia and anesthetists, since it would be but a delivery of the views of our anesthetists, Dr. Sise and Dr. Woodbridge. What I can well discuss, however, is the attitude of heads of surgical departments toward anesthetists, some of my personal experiences with them and my reactions as an operating surgeon to some of the anesthetics. I can speak, of course, only from my own experiences in an organized clinic, in which the operations are done always in the same two hospitals with the same unchanging personnel, and with the same unchanging surgical teams. I realize that these conditions are often difficult for some anesthetists, and that modifications are necessary to meet such changed circumstances.

One of the fundamental requirements for good anesthesia and good anesthetists is, I believe, that the latter should have the opportunity and plently of time to make careful examinations of patients well in advance of the day of the operation. The complete record of a patient's history, physical findings, laboratory data and contemplated surgical procedure should be available for their perusal, in order that they may form an estimate of the patient's condition and the magnitude of the procedure which he is expected to withstand.

The policy of sending patients into the hospital the night before operation and operating on them the next

morning, unless they have been recently and particularly examined and estimated by the anesthetists in the clinic, is, we are convinced, a bad one. If patients arrive at the hospital between 5 and 7 o'clock of the night before operation, as they not infrequently do, no matter when they are told to arrive, there will often be haste and omissions in preoperative examination. In order that this may not occur, we have for some years maintained the rule that patients who are to have major operations must be in the hospital two nights before operation. This permits leisurely examination and preparation. Any major surgical operation has a sufficient percentage of risk attached to it to justify requiring the patient to give sufficient time for careful approach to it.

We feel that the repeated clinical experiences which anesthetists have with definite operative procedures should be turned to advantage to the patient and the surgeon. We have therefore for some time, at the request of Dr. Woodbridge, arbitrarily grouped all risks into grades 1, 2, 3 and 4, grade 1 being a nearly perfect risk, grade 2 a slightly doubtful risk, grade 3 a dangerous risk and grade 4 a risk in which a fatality is probable. No grade 4 risks should be permitted to continue on the operative list, and the anesthetist and surgeon should carefully discuss the operative procedure, the anesthetic and the probable danger in all grade 3 patients. This plan surrounds the operative procedure with an additional safety measure. All experienced surgeons and anesthetists realize that not infrequently patients are lost by routine procedures and by neglect to observe indications of danger which are not strikingly obvious.

We believe that the anesthetist should see the patient postoperatively in order that he may acquire first-hand information from the patient himself as to his objective and subjective reaction to the anesthetic and operation. Furthermore, it is psychologically important both from the point of view of the patient and from that of the anesthetist that contact between them be reestablished after the operation. The anesthetist has played a real part in it, much more real than surgeons have hitherto acknowledged, and he deserves and appreciates a portion of the patient's friendship and gratitude, just as the surgeons do. All surgeons would do well to realize that, provided men of the right character have been selected, anything which increases the responsibility and elevates the position of anesthetists automatically advances anesthesia.

As the director of a clinic in which a considerable amount of surgery is done, I realize that there is a distinct tendency on my part to influence the anesthetists unduly, and to acquire certain fixed views concerning the relation of anesthesia to operation. For example, during the period when ether was employed almost exclusively for abdominal operations, I personally tended to demand considerable depth of anesthesia with its consequent relaxation and facilitation of exposure and approach to operative fields, a situation which was very properly resisted by the anesthetists, particularly in bad risks, because of the shock reactions. I feel that as regards spinal anesthesia, we surgeons have placed undue demands on our anesthetists, particularly in high spinal anesthesia for upper abdominal operations, because of the fact that this type of anesthesia provides such ideal operating conditions. It has not been easy, I know, for our anesthetists, who consider high spinal anesthesia in bad risks a dangerous procedure, to win us away from this type of anesthesia with its beautiful relaxation, quiet respirations and advantageous exposure, and to make us modify our technic to fit some less dangerous anesthesia, such as avertin and regional and intratracheal ethylene in gastric resections, splenectomies, common duct stone explorations and other upper abdominal operations on patients who are bad risks. Having become adjusted to this type of anesthesia, particularly since the intratracheal method and carbon dioxide absorption have been added to the procedure, and being convinced of the additional safety factor which it provides, particularly in long upper abdominal operations on patients who are poor risks, we have become aware that we must not impose our will on our anesthetists.

Surgeons must, in short, realize that the constantly widening field of anesthesia is playing a very large part in the advance of surgery, and they must listen with respect to the opinions of anesthetists as to the effects of various forms of anesthesia on the outcome of various operative procedures, with a willingness to modify the procedures to meet the dangers of anesthesia.

I am aware that in discussing the question of nurse anesthetists I am touching on a subject concerning which there has been considerable debate among anesthetists. Nevertheless, having, as I do, a conviction that the nurse anesthetist has a distinct place in the problem of anesthesia, I must voice my sentiments in favor of retaining her in the field of inhalation anesthesia. One cannot consider the question of improvements in anesthetists and anesthetics without considering their relation to the costs of surgical care. As I have said, if one is to obtain better anesthesia one must obtain better anesthetists, and this implies of necessity, and quite properly, better salaries for anesthetists. Good anesthetists are well worth good salaries, but it would unduly burden the cost of surgical procedures to employ physician anesthetists for all anesthesias. Nurse anesthetists, working under the guidance and direction of physician anesthetists, attain a considerable degree of technical skill in administering inhalation anesthetics, yet may properly command much lower salaries, and so play an extremely desirable part in reducing the costs of anesthesia and hence the costs of surgical care.

Finally—and I hesitate to raise this question, yet feel that I must, since I am in such an unassailable position from which to discuss it, having no personal ax to grind—the medical profession, realizing as it now does the advantages of expert anesthesia, must take a position against the employment of the consultant physician or family physician as the anesthetist. Since we, working in a clinic, are entirely free from partiality, it is my duty for the benefit of those men who are doing surgery, especially in rural communities, to do everything that I can to help them free themselves from this form of patronage, which today actually amounts not infrequently to a disguised form of fee splitting.

It has become an accepted arrangement, handed down from the ether era, that one of the perquisites of the physician referring a patient to a surgeon is that he is to give the anesthetic if he desires. This custom has been largely overcome in good-sized centers, but many surgeons in less populous ones are suffering from it. They wish to develop better anesthesia and anesthetists, but are fearful of eliminating the prevailing arrangement less they lose their surgical consultants. It will be eliminated only when we discuss it frankly, and

when it is made clear to the medical public that such a system does not provide for the patient the best type of anesthesia, an essential feature for his recovery, does not give an opportunity for improvement in anesthesia, does not render to the patient the expert services which the consultant would want for himself or his family and does not permit the surgeon to develop a coordinating and cooperating organization. This is a development which every community needs, and must have if it is not to see an increasing number of its people seeking surgical services in other regions, where such coordination and cooperation exist.

The family physician is the backbone of medicine. He possesses, certainly in this country, a high standard of knowledge, judgment and honesty. I have now for some years given clinics in several of the postgraduate assemblies which occur yearly in all parts of the country. When I see men who have left their general practice to come and spend the better part of a week attending clinics and lectures which not infrequently run from early in the morning to late at night, I am impressed with their high character, and with the spirit which prompts them to take time from an often already overburdened existence in order to seek further knowledge. It is to those men who have naturally accepted the anesthesia perquisite as a legitimate procedure that we must patiently and kindly, but convincingly, demonstrate that it is not the best thing for the patient, for the operations or for anesthesia, and that such a plan hampers advancement in the field of anesthesia—a field which, I take pleasure and satisfaction in admitting, is playing a considerable part in widening and making safer the field of surgery.

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## RESPIRATORY AND CIRCULATORY CHANGES DURING SPINAL ANESTHESIA

M. H. SEEVERS, M.D.
AND
R. M. WATERS, M.D.
MADISON, WIS.

Respiratory paralysis is the usual cause of immediate death from spinal anesthesia. Three mechanisms, or combinations of these, may be involved:

1. Direct action on the medullary respiratory centers by diffusion of the drug to the fourth ventricle in paralytic concentrations. The observations of Koster and Kasman [1] and of Johnston and Henderson,[2] who demonstrated experimentally that excessively high concentrations are required to bring about this effect, indicate that this type can probably be excluded from serious consideration.

2. Ascending block of the intercostal and phrenic nerves. This type of paralysis is unquestionably preventable and is secondary either to (*a*) ignorance of, or inexperience in, the technical aspects of the procedure, or to (*b*) unsuccessful attempts to produce a selective sensory nerve block of the neck and upper thoracic regions.

3. Insufficient nutrient flow of blood through the central respiratory mechanism secondary to cardiovascular depression. Cardiovascular depression in some degree is attendant on every intradural block involving the upper part of the abdomen and the thorax. Since the integrity of the respiratory center depends on the maintenance of an adequate volume flow of sufficiently oxygenated blood, the obvious inference is that the latter mechanism is responsible for the majority of cases of respiratory failure. We shall attempt to demonstrate that the maintenance of an adequate volume flow of well oxygenated blood is difficult if nerve impulses are prevented from reaching a majority of the costal muscles by a high thoracic block.

A study of the factors concerned in the disturbance of circulation may furnish some evidence as to the possible means of prevention of respiratory failure.

Nearly all authors have stressed paralysis of the splanchnic nerves, with a subsequent pooling of blood in the abdominal region, as the principal, if not the only, factor involved in the circulatory depression. Experimental observations on the dog do not substantiate this view, as bilateral splanchnotomy does not produce the characteristic fall of blood pressure. Kremer and Wright [3] have recently observed that bilateral section of the splanchnic nerves of the cat produces a fall in mean blood pressure of only from 0 to 15 per cent. Furthermore, they found little or no change in venous pressure although the vascular bed in the spleen and intestine was markedly enlarged. The clinical findings of an avascular contracted bowel and blanched uterus indicate that all of the "lost" blood is not in the splanchnic region.

Skeletal muscle tone is essential for the maintenance of a stable capillary and venous bed. Loss of this tone accompanies any intradural block. Undoubtedly the splanchnic area is not the only region in which one can expect an enlarged capillary bed. Plethysmographic records made in this laboratory indicate a considerable increase in leg volume of dogs under spinal anesthesia.

It is of relatively little practical importance whether paralysis of the splanchnic nerves, the vasoconstrictor nerves to the skin and other vessels of the trunk and extremities or loss of skeletal muscle tone is the principal or contributory factor to the circulatory depression. All will admit that a marked decrease in the peripheral resistance to blood flow occurs in the region involved in the block.

Significant, however, is the fact that a sensory and motor block to the tenth dorsal segment, which produces an increased capillary bed over a considerable portion of the body, is usually attended only with a moderate alteration in blood pressure. (Rarely a marked drop in pressure may be due to a motor paralysis higher than is indicated by sensory examination.) Apparently vasoconstriction in other parts of the body or an increased cardiac output can occur as a compensatory measure. Furthermore, adequate oxygenation of blood and normal thoracic activity occurs, since there is no respiratory involvement.

Grave cardiovascular changes occur, as a rule, only in blocks that involve the chest. As the thorax is implicated, two important factors enter into consideration: (1) additional paralysis of the vasoconstrictor fibers and (2) intercostal nerve paralysis.

While the first factor has been elaborated by writers on the subject, little attention has been directed to the

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1. Koster, H., and Kasman, L. P.: Surg., Gynec. & Obst. **49**: 617 (Nov.) 1929.

2. Johnston, J. F. A., and Henderson, V. E.: Anesth. & Analg. **11**: 78 (March-April) 1932.

3. Kremer, M., and Wright, S.: Quart. J. Exper. Physiol. **21**: 319, 1932.

consequence of partial or complete loss of costal respiration when superimposed on a vascular incompetence involving two thirds of the body. Clinicians see patients who suffer no outstanding ill effects from a diminution in minute volume respiration, particularly if this is of short duration. This may explain why the diminished respiratory exchange occurring during spinal anesthesia has been minimized. The conditions that exist during spinal anesthesia deviate markedly from the normal. The increased vascular bed secondary to the aforementioned factors means low blood pressure, diminished minute volume flow of blood and poor oxygenation of tissues. The integrity of the medullary centers and heart is dependent on an adequate supply of oxygen. The additional anoxemia accompanying partial or complete thoracic paralysis may spell disaster.

That the oxygen needs of the body are not adequately met, owing to a reduced volume flow of blood and a decreased gaseous exchange in the lungs proportional to the lowered thoracic excursion, is the contention that constitutes the main thesis of the present communication.

In 1912, Gray and Parsons [4] published a clinical study in which they stressed the intimate relationship existing between the fall in blood pressure and the costal paralysis. Their conclusion—"The main fall is due to the thoracic paralysis, which is not compensated for by overaction of the diaphragm, and consequently the aspiration action of the thorax is diminished"—being at variance with the view of some physiologists concerning the mechanical movement of venous blood by variations in intrathoracic pressure, has not been generally accepted. We believe that their observation was essentially correct. Whether or not we accept their conclusion as to the mechanism involved, the fact remains that a partial or total loss of costal respiration diminishes gaseous interchange.

Isenberger and Lundy [5] observed that artificial respiration accomplished by alternate inflation and deflation of the lungs, with positive and negative intrapulmonary pressure, would maintain a nearly normal blood pressure in dogs after complete paralysis of the spinal cord produced by large doses (2,500 mg.) of procaine hydrochloride intradurally. This observation indicates that the heart will remain competent in spite of the decreased peripheral resistance provided fairly normal thoracic activity and pulmonary interchange occur. This method offers a means of study of the relative importance of the respiratory and cardiovascular factors with which we are concerned under the conditions existing in high spinal block. Accordingly, we have employed a similar method, a brief outline of which follows.

## METHOD

Large dogs were used as the experimental animals. They were anesthetized three hours before the experiment with sodium barbital, 250 mg. per kilogram intravenously. An initial mean blood pressure of from 140 to 170 mm. of mercury and good respiratory activity were assured by this method. A few controls with ethylene and others with local infiltration to accomplish the operative procedures indicated that barbital modifies the end-result but slightly, provided sufficient time (three hours) is allowed after the injection before beginning the experiment. Removal of one spinous process or partial laminectomy was performed to insure intradural block.

The animal was then placed in a small Drinker respirator. This apparatus offers an ideal mechanical means of simulating normal costal respiration besides serving as a body plethysmograph to record respiration. Unobstructed respiration was assured by either a tracheal cannula or a closed endotracheal catheter. Thirty-seven animals were utilized, the procedure being to induce a block with procaine hydrochloride or to section the cord at various levels and accomplish as many of the following observations as were compatible with the technic involved:

(*a*) Cardiovascular data: heart rate, pulse pressure, mean arterial pressure, right auricular and iliac venous pressure and leg volume.

(*b*) Respiration: rate, amplitude, type, minute volume exchange, intra-abdominal and intrapleural pressures, alveolar oxygen and carbon dioxide, blood oxygen and carbon dioxide and oxygen consumption.

(*c*) Treatment: artificial respiration, oxygen, carbon dioxide, position, pressure on body and various pressor and stimulant drugs.

As the limitations of the present paper will not permit detailed experimental data,[6] we have chosen to consider individually each of the foregoing factors, attempting to correlate the laboratory findings with data gathered from about fourteen hundred clinical cases from the anesthesia service of the Wisconsin General Hospital.

## OBSERVATIONS

*Cardiovascular Data.*—The tendency of the heart rate to remain relatively slow in either low or high blocks is well known clinically. The dog usually exhibits a tendency to vagotonia, particularly if the block is high. The relatively slow heart seen clinically allows an increased diastolic filling and a relatively large stroke volume provided the integrity of cardiac muscle is not impaired by myocardial disease or anoxemia secondary to chronic anemia, extensive hemorrhage, etc. Clinically, a rapid heart during spinal anesthesia is a danger signal and usually follows a diminished blood volume secondary to hemorrhage. It is serious and demands an immediate replacement of the original circulating volume. This condition is readily produced in dogs by hemorrhage.

The fall in systolic pressure is directly proportional to the height of the block. A lowered diastolic pressure is the rule, since it is a measure of the peripheral resistance to blood flow. In laboratory and clinical cases involving the thorax untreated by pressor drugs, a small pulse pressure usually obtains. Although the diminished pulse pressure is a rough indication of a diminished cardiac output, it appears from both laboratory and clinical observations that this condition may exist without observable deleterious effects until the cardiac muscle begins to fail from lack of sufficient oxygenation. Burch and Harrison [7] have demonstrated that there is little reduction of cardiac output in dogs under spinal anesthesia until the mean arterial blood pressure falls to 40 or 50 per cent of its original value.

The conception prevails that in consequence of a pooling of blood in the splanchnic region, there exists an ineffective filling pressure on the right side of the heart. Study of the venous pressure of dogs obtained directly by introduction of a cannula through the right

4. Gray, H. T., and Parsons, L.: Quart, J. Med. **5**: 339 (April) 1912.

5. Isenberger, R. M., and Lundy, J.: Personal communication to the authors. Lundy, J.: Proc. Staff Meet., Mayo Clin. **7**: 225 (April 13) 1932.

6. Seevers, M. H., and Waters, R. M.: California & West. Med. **35**: 169 (Sept.) 1931. (Preliminary report.)

7. Burch, J. C., and Harrison, T. R.: The Effect of Spinal Anesthesia on the Cardiac Output, Arch. Surg. **21**: 330 (Aug.) 1930.

external jugular into the right auricle indicates that a rise in venous pressure usually occurs, which is proportional to the fall in mean arterial pressure (fig. 1). A rise in venous pressure in the iliac vein also occurs. If the total blood volume is diminished by hemorrhage, however, a fall in venous pressure in the right auricle is observed. The prevailing opinion of cardiologists is that the output of the heart per minute is largely dependent on the effective filling pressure and heart rate provided the integrity of cardiac muscle is unimpaired. Since under these conditions as great or a greater effective filling pressure exists, it becomes obvious that the weak point in the system is the heart itself.

To be effective on cardiac output, this increased pressure in the right auricle must be transmitted from the right side of the heart through the capillaries of the lungs to the left side of the heart. Drinker and his collaborators [8] have shown that the capillaries of the lungs are subject to remarkable increases in capacity by passive distention. If the left side of the heart is

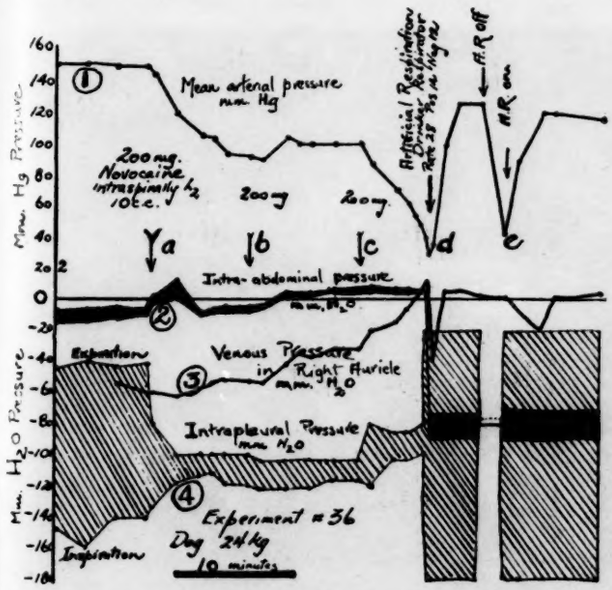


Fig. 1.—Curve *1*, mean arterial blood pressure (millimeters of mercury). Curve *2*, intra-abdominal pressure (millimeters of water). Curve *3*, venous pressure in the right auricle (millimeters of water). Curve *4*, intrapleural pressure (millimeters of water). Respiratory fluctuation. The upper line indicates expiration; the lower line, inspiration. *a*, *b* and *c* indicate intraspinal injection ($L_3$) of 200 mg. of procaine hydrochloride in 10 cc. of saline solution; *d* and *e*, artificial respiration with the Drinker respirator (positive, 14; negative, 12).

failing as a result of anoxemia, it necessarily follows that there will be an increase in the capacity of the lungs for blood and a decrease in their capacity for air. If these assumptions are accepted, it becomes obvious that a considerable portion of the circulating blood may be congested in the pulmonary vessels.

The conception held by some writers, that spinal anesthesia confers on the heart a period of physiologic rest, because the heart is relatively slow, appears to us to be as illogical as to assume that acute anemia or acute cardiac decompensation relieves the cardiac muscle of its normal load of work.

It is well known that a decreased venous pressure exists at the right side of the heart during shock of hematogenic origin.[9] It has been generally accepted that this observation is applicable to spinal anesthesia. The origin of shock in spinal anesthesia is initially entirely neurogenic. Many a clinician has compared in his mind the case of spinal anesthesia with a blood pressure so low as to be barely recordable, with the case of shock following hemorrhage, and wondered why the same type of resuscitory measures revived the former and failed in the latter. We must seek the answer in the knowledge that a diminution of total circulating blood volume with a loss of the integrity of the vessel walls as regards fluid and blood proteins occurs in hematogenic shock. It becomes apparent that this condition does not exist in the average case of spinal anesthesia. That prolonged spinal anesthesia may cause such a result, and that it may be superimposed on spinal anesthesia are well known. It is likewise well recognized that it is poor surgical judgment to superimpose spinal anesthesia on an existing shock following extensive hemorrhage. This was well demonstrated in the war experience of Marshall,[10] who observed that the mortality after spinal anesthesia occurred in the group of cases in which hemoglobin was below 100 with the Haldane hemoglobinometer.

*Respiration.*—Experimentally, the efficiency of respiration, thoracic excursion and minute volume exchange decreases in blocks involving the thoracic region. This decrease is proportional to the height of the block. In general, the same alterations are seen clinically. Compensation by increased diaphragmatic activity may occur in the low thoracic blocks. Although this overactivity of the diaphragm increases with high thoracic blocks, it is less effective in maintaining a good pulmonary ventilation. This overactivity of the diaphragm is hindered and rendered inconspicuous in the Trendelenburg position owing to the pressure of the abdominal viscera. That pulmonary ventilation is decreased is further evidenced by our studies of alveolar and blood oxygen and carbon dioxide, both in man and in dogs. A considerable decrease in alveolar, as well as in arterial and venous blood oxygen occurs, with a corresponding increase in carbon dioxide. Oxygen consumption in dogs rises and falls with the changes in arterial pressure. We interpret this as an indication of a diminished volume flow of blood rather than a diminished utilization of oxygen. Greene and Greene [11] emphasized that in experimentally produced anoxemia little change in utilization of oxygen occurs until the arterial saturation falls to a very low point, provided the blood pressure is unaltered. The saturation of arterial blood, however, varies directly as the circulating volume passing the pulmonary epithelium. Thus, a greater undersaturation of arterial and venous blood and a decrease in total oxygen consumption indicate a diminished volume flow of blood.

Further evidence of the decrease in pulmonary ventilation is furnished by studies of intrapleural pressure variations. The normal intrapleural variations in the barbitalized dog are from an inspiratory pressure of $-12:-18$ cm. of water to $-4:-5$ cm. of water during expiration (fig. 1). With a complete paralysis of costal respiration, these variations are reduced to $-10:-12$ during inspiration and $-8:-10$ during expiration.

The mean intra-abdominal pressure under these conditions normally varies from $-2$ to $+3$ cm. of water, with a respiratory fluctuation of from 0.5 to 1 cm. of water. We have always observed an increase

8. Drinker, C. K.; Churchill, E. D., and Ferry, R. M.: Am. J. Physiol. **77**: 590 (Aug.) 1926.
9. Meek, W. J., and Eyster, J. A. E.: Am. J. Physiol. **56**: 1 (May) 1921.
10. Marshall, G.: American Year-Book of Anesthesia and Analgesia, New York, 1917-1918, p. 225.
11. Greene, C. H., and Greene, C. W.: Am. J. Physiol. **62**: 542 (Nov.) 1922.

in mean intra-abdominal pressure, as well as in respiratory fluctuation, following paralysis of costal respiration. The changes are probably largely due to increased diaphragmatic activity. These findings are contrary to the ideas of Gray and Parsons, who believed that a decreased intra-abdominal pressure existed secondary to flaccid paralysis of the abdominal musculature.

*Treatment.*—From the foregoing observations, we have gained the impression that the extremely close relationship existing between oxygenation of tissues and the maintenance of good cardiovascular function must be exceedingly important in spinal anesthesia. Experiments to study this relationship further were therefore performed, with the following results:

1. Artificial respiration alone, with the Drinker respirator, using alternate positive and negative pressures, will maintain the blood pressure near its original level after either a block completely paralyzing all respiratory activity or section of the cord at the corresponding level (fig. 2). These observations agree with those of Isenberger and Lundy. Either negative pressure or positive pressure alone, while sufficient to sustain life, is not so effective in maintaining a good arterial blood pressure. The same applies to chest compression or positive intrapulmonary pressure.

2. Exposure of the epithelium of the lungs to high concentrations of oxygen markedly augments the beneficial effects of artificial respiration.

3. Passive distention of the lungs with 100 per cent oxygen will maintain an adequate blood pressure in the absence of any respiratory movement for at least fifteen minutes (fig. 3). Apparently the only limitation to the procedure is the accumulation of carbon dioxide in tissues.

4. Inhalation of carbon dioxide in 5 and 10 per cent concentrations in oxygen always resulted in further lowering of the blood pressure in the animal with a low blood pressure accompanying thoracic paralysis. These inhalations were beneficial, however, in hastening a return of intercostal activity in the animal in which thoracic function was beginning to return at the termination of the block.

In view of these observations, there can be little doubt as to the validity of our original premise. Unquestionably the cardiovascular system will remain competent even though peripheral resistance to blood flow has been reduced to a minimum by paralysis of all vasomotor nerves and skeletal muscle, provided the volume of adequately oxygenated blood retained within the vascular boundaries is sufficient to keep up an effective circulation to the vital organs. This knowledge makes it easier to study therapeutic procedures rationally. Four methods of approach suggest themselves to combat the altered physiologic conditions. All have been clinically utilized. They are:

1. Increase of the easily available oxygen of the blood by exposure to high alveolar oxygen percentages or artificial respiration.

It seems reasonable that every patient under spinal anesthesia should be given the benefit of inhalations of oxygen. This conception is verified by clinical as well as laboratory observations. Patients are more comfortable, less nauseated, maintain a better blood pressure and have a better postoperative recovery following the exhibition of oxygen during the surgical procedure. This is particularly true if sedatives in sufficient quantities to produce any respiratory or circulatory depression have been administered prior to the block.

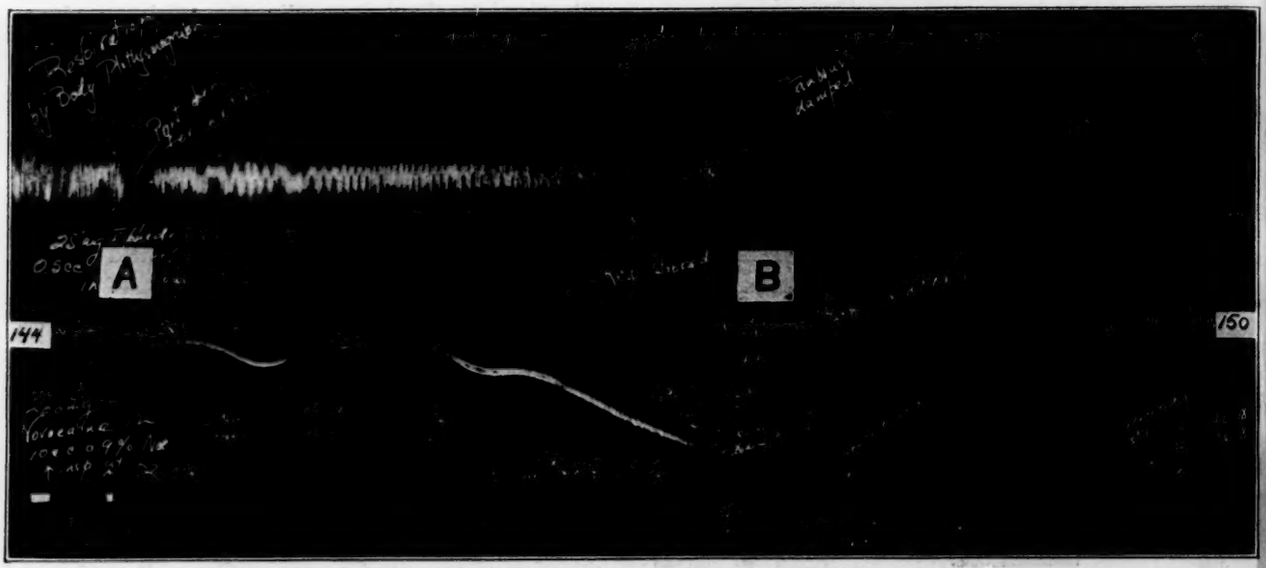


Fig. 2.—*A*, mean arterial blood pressure, 144 mm. of mercury. Intraspinal injection ($L_2$) of 200 mg. of procaine hydrochloride in 10 cc. of physiologic solution of sodium chloride. (Note the primary respiratory paralysis.) *B*, artificial respiration with the Drinker respirator. Breathing 100 per cent oxygen. No cardiac impulse to mercury manometer for two minutes. Ten degrees Trendelenburg for two minutes. Mean arterial blood pressure, 150 mm. of mercury five minutes after artificial respiration.

It is not generally recognized clinically that any significant increase in available oxygen can be assured by the inhalation of oxygen. Sollmann [12] gives the following figures: Arterial blood contains about 18.5 per cent of oxygen in chemical combination with hemoglobin and 0.6 per cent dissolved in plasma, a total of 19.1 per cent. Inhalation of undiluted oxygen increases the percentage of oxyhemoglobin only to 18.7 per cent; the dissolved oxygen is increased in proportion to the partial pressure, i. e., to 3 per cent, giving a total of 21.7 per cent, or an increase of 2.6 per cent. Since oxyhemoglobin does not readily yield all of its oxygen to tissues, Haldane [13] considered that this

12. Sollmann, T.: Manual of Pharmacology, ed. 3, Philadelphia, W. B. Saunders Company, 1926, p. 769.
13. Haldane, J. S.: Respiration, New Haven, Conn., Yale University Press, 1922.

apparently small increase really equals about 40 per cent of the easily available oxygen of the blood. In consideration of the diminished minute volume flow of blood accompanying spinal anesthesia, it appears that this increase may be quite significant.

From our observations on dogs, the simultaneous administration of carbon dioxide in the cases of impending respiratory paralysis secondary to low blood pressure is of no benefit. On the contrary, a lowering of blood pressure occurs. Since the central stimulant action of carbon dioxide depends on a fair oxygenation of medullary centers and its effectiveness on intact vasoconstrictor pathways, these results might be expected in high blocks. Apparently, a concentration of carbon dioxide that will stimulate the depressed respiratory or vasoconstrictor centers cannot be reached without exerting a predominant paralytic effect on the peripheral blood vessels.

Should respiratory paralysis supervene, whether due to direct nerve block or secondary to cardiovascular incompetence, artificial respiration must be resorted to. The two phase type comprising forcible inspiration and expiration is preferable. Although this is best administered by mechanical devices, such as the Drinker respirator, it can be readily accomplished by a modification of the Schäfer method, pressure on the chest being used to effect expiration and compression by a second operator of a distended oxygen-filled bag fitted to a face mask to insure good inspiration. The latter procedure alone will suffice, as the lungs are distended with only slightly diluted oxygen. Overdistention of the bag is to be avoided, as compression of the pulmonary vessels prevents an adequate flow of blood to the left ventricle. It seems reasonable that a moderate distention, however, may be beneficial by relieving pulmonary congestion, thus making more blood available for systemic circulation. Obviously, a good airway is imperative. This can best be assured by pharyngeal or endotracheal intubation. The stomach may be easily inflated if positive pressure is applied to a bag attached to a face mask. This distention will contribute to the circulatory embarrassment and can be avoided by an endotracheal catheter.

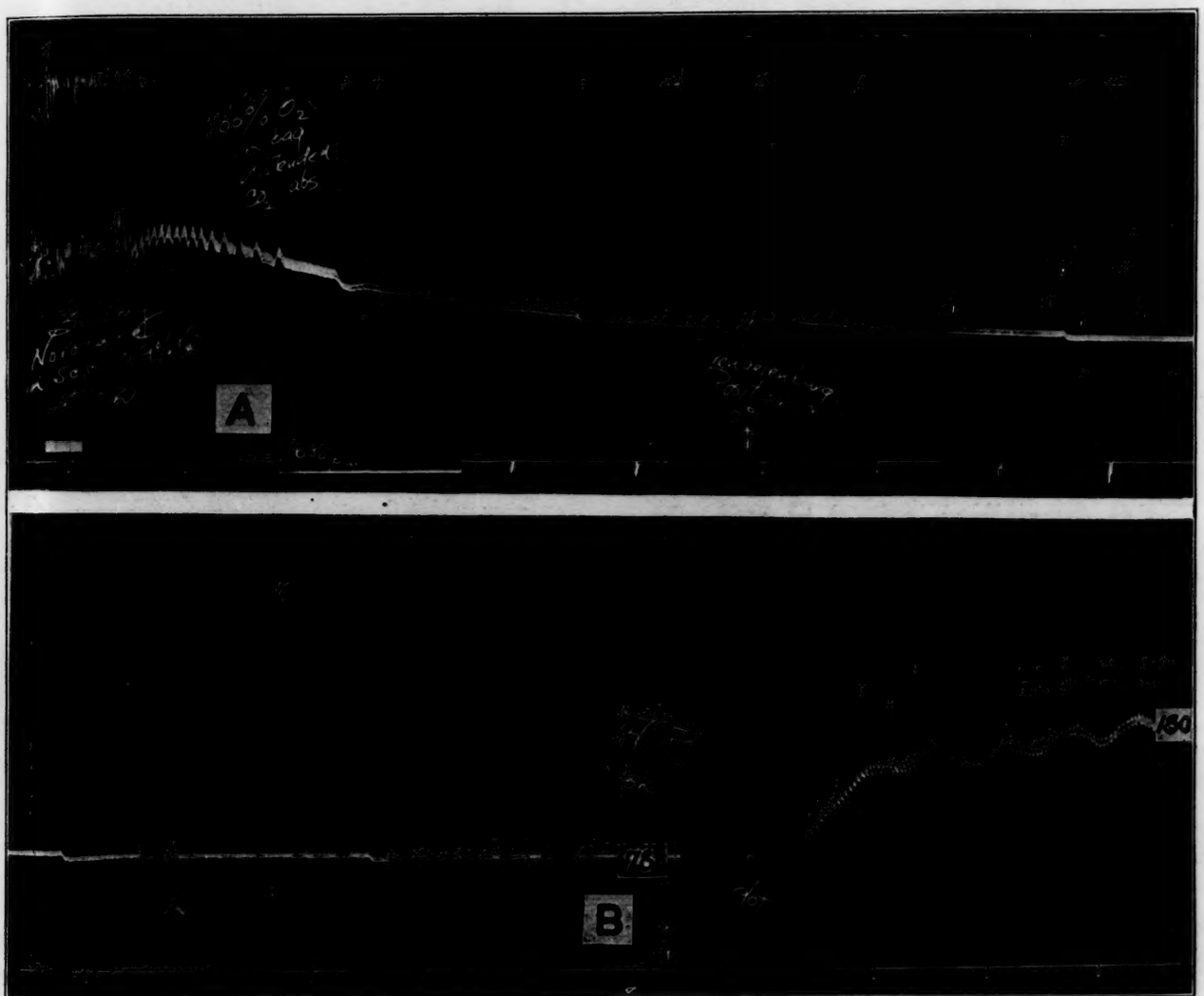


Fig. 3.—Upper tracing: *A*, mean arterial blood pressure, 170 mm. of mercury. Intraspinal injection ($L_2$) of 300 mg. of procaine hydrochloride in 5 cc. of saline solution. Immediate costal and phrenic nerve paralysis (upper line). The lungs expanded with 100 per cent oxygen. Lower tracing: *B*, mean arterial blood pressure, 78 mm. of mercury. There has been no respiratory movement for sixteen minutes. Artificial respiration with the Drinker respirator. Five minutes later, the mean arterial pressure was 180 mm. of mercury.

It is likely that the Drinker respirator acts as a mechanical aid to circulation by pressure on the extremities, abdomen and chest (fig. 4). This constitutes the ideal method of treatment, since no intubation is necessary and no gastric inflation is possible.

2. The use of drugs to effect an increase in peripheral resistance or an increase in cardiac output.

The drugs commonly employed at present are epinephrine and ephedrine. That the first is worthless for the prolonged maintenance of blood pressure is evidenced both in the laboratory and in the clinic. It may be of value, however, in cases of sudden circulatory collapse as a temporary expedient until the effects of some longer acting drug may be attained. The prolonged intravenous infusion of dilute solutions may also be effective.

Ephedrine has received an extended clinical trial in spinal anesthesia since first advocated by Ockerblad and Dillon,[14] given either prophylactically prior to the block or intravenously after the block. Evidence from both the clinic and the laboratory indicates that its continued use is warranted. These observations also lead to certain definite conclusions regarding its use.

The effectiveness of ephedrine appears to be due to its ability to (*a*) increase the peripheral resistance by constricting arterioles and (*b*) increase the minute volume output of the heart by direct action on the cardiac muscle.[15] It is well known pharmacologically that the efficacy of drug stimulation depends on the physiologic state of the cell to be stimulated. Ephedrine is no exception to this rule. The anoxemic heart and the blood vessel, the permeability of which to fluids and proteins is increased from oxygen deprivation, cannot be expected to respond. For this reason, ephedrine is a disappointment in shock of hematogenic origin. This is a common clinical observation. Chen[16] has demonstrated the relative impotence of ephedrine in combating this type of shock in dogs. Our laboratory observations confirm this finding. Cases of spinal anesthesia have been reported in which disastrous results have been laid to repeated relatively large doses of ephedrine. We have observed that the effectiveness of ephedrine in the dog following intradural block is in inverse relation to the degree and duration of low blood pressure and anoxemia.

The use of large doses of ephedrine to maintain a blood pressure higher than normal throughout the

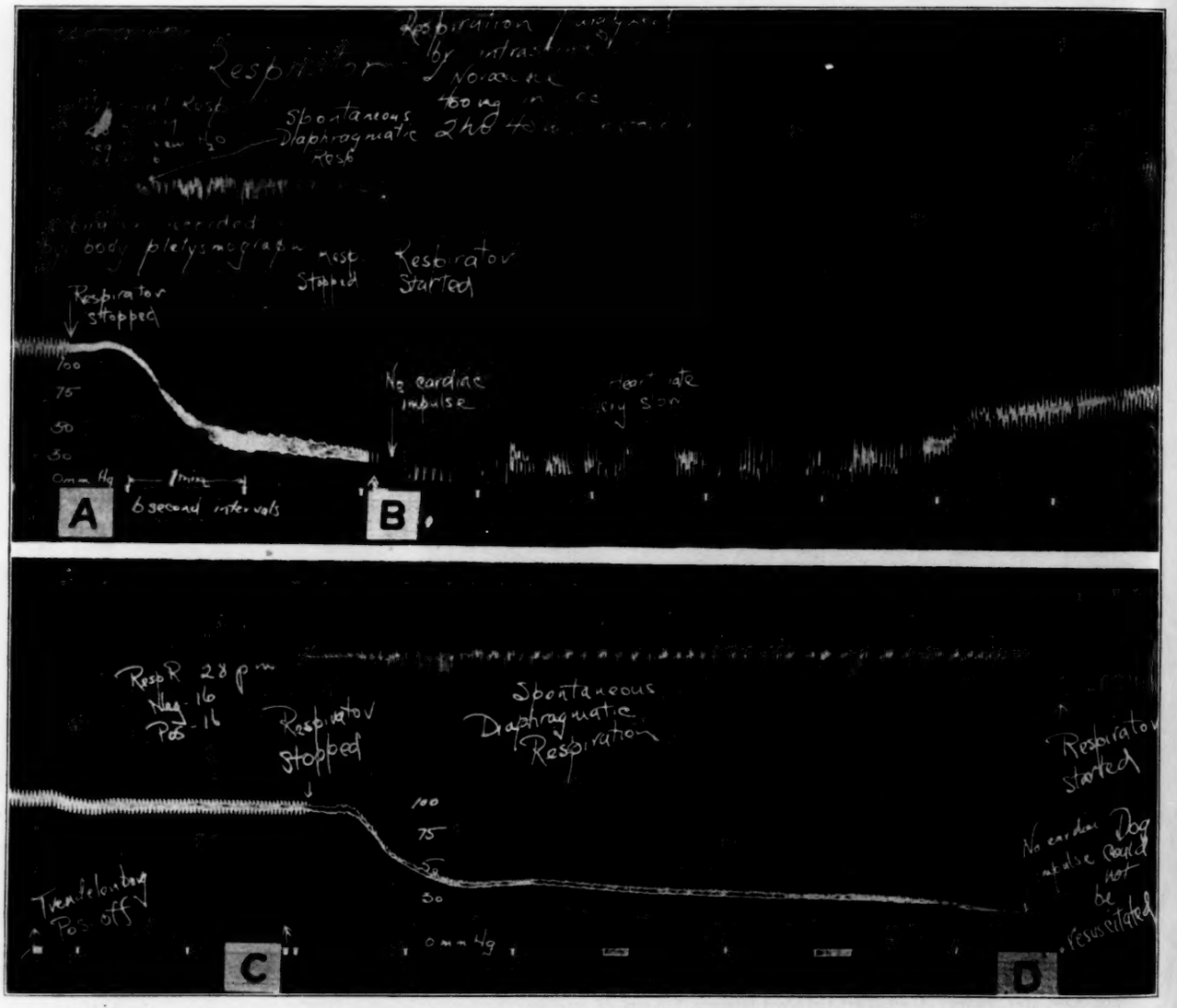


Fig. 4.—Upper tracing: The dog had been artificially respired for one hundred and sixty-five minutes following the intraspinal injection of 400 mg. of procaine hydrochloride in 10 cc. of 0.9 per cent saline solution. Blood pressure, 100 mm. of mercury: *A*, respirator stopped. Note that spontaneous diaphragmatic respiration is not adequate. *B*, respirator started. Heart rate 15 per minute. Blood pressure 30 mm. of mercury. Lower tracing: Twenty minutes after upper record. *C*, respirator stopped. Note again that spontaneous respiration is inadequate. *D*, respirator started. Could not be resuscitated after six minutes, with blood pressure at 30 mm. of mercury.

14. Ockerblad, N. F., and Dillon, T. G.: The Use of Ephedrine in Spinal Anesthesia, J. A. M. A. **88**: 1135 (April 9) 1927.

15. Chen, K. K., and Schmidt, C. F.: Medicine **9**: 1 (Feb.) 1930.
16. Chen, K. K.: J. Pharmacol. & Exper. Therap. **26**: 83 (Sept.) 1925.

operative procedure may mask for a period the symptoms of impending shock of hematogenic origin. When the overstimulation resultant from drug action subsides, circulatory collapse may occur, which, had it been recognized and treated early by fluid or blood replacement, might have been averted. Its marked cardiac action indicates discretion in its use when cardiac disease is known or expected. We have seen no evidence of circulatory or other damage from ephedrine in cases of uncomplicated spinal anesthesia if the dose is limited to that sufficient to restore normal blood pressure, provided the tissues are adequately oxygenated.

3. The use of position to favor gravitational circulation.

The efficacy of this procedure in the prevention of medullary paralysis has been demonstrated clinically. That it may have some disadvantages besides hindering surgical manipulation in the upper part of the abdomen has not been stressed. The weight of the abdominal viscera tends to compress the contents of the thorax, particularly in the exaggerated Trendelenburg position. Experimentally, there occurs an increase in venous pressure in the right side of the heart. There is no evidence from laboratory experimentation that the cardiac output is materially increased, although a slight rise in blood pressure occurs. The failing heart may allow an increased volume of blood in the pulmonary vessels and a diminished vital capacity. Hamilton and his co-workers[17] have recently reiterated the well known fact that a marked decrease in the vital capacity occurs even in the recumbent position. If these facts are accepted, we may postulate that certain portions of the lungs will remain in a state of relative atelectasis. This is particularly true if expansion of the lungs is further hindered by thoracic paralysis. In view of this reasoning, it seems possible that the Trendelenburg position may be a factor in the etiology of postoperative pulmonary complications.

*Pulmonary Complications in Fourteen Hundred Cases of Spinal Anesthesia in the State of Wisconsin General Hospital* *

| | Operations on Upper Part of Abdomen | Operations on Lower Part of Abdomen | Extra-Abdominal Operations |
|---|---|---|---|
| Cases | 351 | 571 | 484 |
| All respiratory complications (until time of discharge from hospital) | 82 (23.3%) | 113 (19.8%) | 24 (5.0%) |
| Severe respiratory complications | 22 (6.2%a) | 27 ( 4.7%) | 11 (2.2%) |
| Deaths | 14 (3.9%) | 8 ( 1.4%) | 9 (1.8%) |

* Through Dr. Martha Kohl.

Sise,[18] of the Lahey Clinic, stated in his report of the incidence of postoperative pulmonary complications his belief that the type of operation and the preoperative condition of the patient are more important factors in the production of these complications than the type of anesthesia. He found, to his surprise, that the number of complications following spinal anesthesia was in the same order of magnitude as with ether anesthesia.

Statistics of pulmonary complications in fourteen hundred cases of spinal anesthesia in the State of Wisconsin General Hospital are available (table).

Unfortunately no statistics on general anesthesia are yet available under conditions existing in this hospital.

Other authors, on the contrary, apparently have been more fortunate. This is due, perhaps, to a greater skill in technic, a better selection of risks or such an enthusiasm for the procedure that postoperative complications are looked for only at the autopsy table or are ascribed to causes other than spinal anesthesia.

4. Increase in the total volume of circulating blood.

If one assumes that during the early stages of spinal anesthesia the permeability of the vessel wall is unaltered and the original blood volume remains intravascular, then measures that will increase the total volume might be expected to effect a beneficial influence on pressure.

Burch and Harrison[19] found that the injection of rather large amounts of physiologic solution of sodium chloride prior to intradural block in dogs was quite effective in preventing the marked fall in blood pressure.

If the method is to be of the most benefit, obviously it must be utilized while the vessels are still physiologically intact. This means either prior to, or throughout the course of the operation.

If spinal anesthesia happens to be the method of choice for operation on a patient who is a poor risk, we follow the practice of using a slow intravenous drip, which is started immediately after the block has been induced. Intravenous medication is then instantly available.

## COMMENT

In view of experimental and clinical observations, we believe that too little stress has been placed on the rôle of respiration in the maintenance of cardiovascular integrity during spinal anesthesia. Our conception of the train of events occurring during untreated high spinal block is as follows: initial decrease in peripheral resistance to blood flow by vasomotor nerve and skeletal muscle paralysis; decrease in minute volume respiration accompanying intercostal nerve paralysis; inadequate oxygenation of blood; diminished minute volume blood flow; progressive loss of vascular tone over the whole body and acute cardiac incompetence, both the result of oxygen deprivation; failure of the medullary respiratory mechanism as the nutrient flow of blood becomes inadequate, the latter occurring while the heart is still capable of being revived by oxygenation.

We believe that the rational use of spinal anesthesia with maximum safety to the patient implies the following:

1. Proper selection of risks, the deciding factors for its use being the absolute need for complete muscular relaxation and the ability of that particular patient to oxygenate his tissues normally. This, of course, precludes the routine use of spinal anesthesia for all patients with abdominal conditions. With spinal anesthesia, as well as with any other anesthetic procedure, individualization must replace "rule of thumb" practice.

2. Limitation of the block to exclude major thoracic involvement. Enthusiasts[1] for the procedure have advocated spinal anesthesia for operations on the head and neck. Any method dependent for its factor of safety on a selective paralysis of sensory as opposed to motor nerves, especially when the motor components are the phrenic nerves, deserves little consideration. This is particularly true in view of the technical diffi-

17. Hamilton, W. F.; Moore, J. W.; Kinsman, J. M., and Spurling, R. G.: Am. J. Physiol. **99**: 534 (Feb.) 1932.
18. Sise, L. F.: Anesth. & Analg. **11**: 23 (Jan.-Feb.) 1932.
19. Burch, J. C., and Harrison, T. R.: The Effect of the Administration of Fluid on the Fall in Blood Pressure Caused by Spinal Anesthesia, Arch. Surg. **22**: 1045 (June) 1931.

culty inherent in the exhibition of a selective drug concentration to the nerve components concerned. This difficulty is apparent in the experience of the proponents of the method. A blood pressure so low as to require palpation of the abdominal aorta to determine whether the heart is still active is hardly compatible with what is ordinarily considered to constitute good anesthesia.

3. To combat cardiovascular collapse by the judicious use of the following: Inhalation of oxygen throughout the surgical procedure; the prophylactic or therapeutic use of ephedrine to maintain the original blood pressure (we believe that the patient who might be damaged by moderate doses of ephedrine is not a suitable risk for spinal anesthesia); the use of a moderate Trendelenburg position when indicated, and the proper administration of fluid while the blood vessels and heart still maintain their physiologic integrity. We do not intend to imply that in every case in which spinal anesthesia is used the patient needs or should have all this treatment.

4. Artificial respiration with undiluted oxygen in impending circulatory or respiratory failure.

5. Postoperative hyperventilation with carbon dioxide periodically throughout the first twenty-four hours to expand atelectatic portions of the lungs.

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## ADVANCES IN ANESTHESIA FROM THE STANDPOINT OF THE ANESTHETIST

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One cannot consider advances in anesthesia from the standpoint of the anesthetist without making at least some reference to older anesthetic agents and to the methods of their administration. Chloroform and mixtures containing chloroform continue to fall more and more into disuse, although from time to time its employment is advocated by those who are skilled in its administration.[1] The use of ethyl chloride, other than as an agent for anesthetizing tissue by freezing, has been debated, especially from the standpoint of safety. There are satisfactory ways of inducing anesthesia without ethyl chloride.[2]

Ether, though still widely used by the open drop or semi-open drop method, is becoming less acceptable when so administered than when it is mixed with the gases. Ether given by rectum is being replaced by tribromethyl alcohol (avertin) or tribromethyl alcohol and amylene hydrate. This seems to be an advance. When anesthesia is produced by ether given rectally, it is less easily controlled than when it is given by inhalation. As more and more patients are anesthetized with tribromethyl alcohol, it is being shown that a dose large enough to produce anesthesia should seldom be used. Tribromethyl alcohol tends to be used more and more as a preliminary medicament, to be followed by a local anesthetic or by a general anesthetic given by inhalation in a reduced dose.

Nitrous oxide continues to be the most generally popular gas anesthetic agent, especially for extraction of teeth. This is due largely to the fact that it is not inflammable, and for that reason can be used with more safety than an inflammable gas. Ethylene is widely used and has been generally satisfactory. Its introduction in 1923 marked one of the most outstanding advances in anesthesia in recent years.[3] There have been a few accidents due to its inflammability, and no doubt there will be more unless the generally recognized precautions incident to its use are observed. There are phases of the technic of using this agent that I wish to call to your attention. In addition to maintaining a high humidity and using grounding devices for the gas machine and other furnishings in the operating room, it is well to begin anesthesia with nitrous oxide and oxygen and then to substitute ethylene for the nitrous oxide. At the termination of anesthesia all ethylene and ether are, or should be, flushed out of the machine with a mixture of nitrous oxide and oxygen, regardless of whether carbon dioxide has been used.

Carbon dioxide has been used to produce anesthesia, but its best application is not as an anesthetic but for the purpose of regulating the depth of respiration.[4] This has been a distinct advance in dental, surgical and medical cases. The use of carbon dioxide diluted with nitrous oxide, ethylene or oxygen frequently has helped to control nausea and vomiting in cases in which general or spinal anesthesia has been used. It has been used to advantage in the control of postoperative and nonoperative cases of hiccup, and in some cases its use has made possible the avoidance of straining during gas anesthesia, without the use of ether in addition to the anesthetic gases. When ether is used for admixture, carbon dioxide facilitates the absorption of ether and hastens the induction of satisfactory anesthesia.[5] I think that the postoperative administration of carbon dioxide and oxygen for hyperventilation is a distinct advance in lessening postoperative pulmonary complications.

Magill [6] has made a revolutionary change in methods by his advocacy of intratracheal anesthesia. Formerly, small, hard catheters were used, through which the anesthetic agent was insufflated. Recently, Magill has introduced the use of large, soft rubber tubes through which the patient may inhale or through which the anesthetist may insufflate not only the anesthetic, but also oxygen. Flagg [7] also has demonstrated the efficacy of the large caliber tube. The intratracheal method is particularly useful in intrathoracic surgery, in plastic and other operations on the head and in any operation in which difficult respiration or the posture of the patient makes the administration of a general anesthetic agent by the usual methods more difficult than when the tube is used.[8] Skilful insertion of the large, soft rubber tube eliminates much of the criticism of the method, and gives the anesthetist positive con-

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From the Section on Anesthesia, the Mayo Clinic.

Read before the Section on Pharmacology and Therapeutics, at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

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4. Henderson, Yandell: Respiration in Anesthesia: Control by Carbon Dioxide, Brit. M. J. **2**: 1170 (Dec. 19) 1925.

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7. Flagg, P. J.: Intratracheal Anesthesia, Arch. Otolaryng. **5**: 394 (May) 1927.

8. Tovell, R. M.: Intratracheal Anesthesia, Anesth. & Analg. **10**: 97 (May) 1931.

trol of anesthesia and ventilation; obviously it is a distinct advance, especially when methods of inhalation are otherwise difficult. Magill's intratracheal tube has been used in certain cases in which obstructed respiration has complicated other conditions, such as convulsions and swelling or tumors of the throat and neck, or in medical cases in which artificial respiration must be carried on for several hours.

There has been great advance in the methods of administering local anesthetics, and this type of anesthesia continues to be used extensively, especially when patients constitute bad risks. Regional methods of anesthesia are useful if the technic of their application has been mastered; for example, sacral block for operations on the anus and for perineal operations on the rectum is usually the method of choice, as is field block for operation for bunions. Surface anesthetics in ointments, gels and solutions have a definite field in the relief from pain of open wounds and are innovations of merit. The application of a local surface anesthetic agent in the postoperative period, instead of a general analgesic such as morphine, gives, comparatively at least, as much increased benefit as can be derived, in operation, from the use of a local anesthetic rather than of a general anesthetic.

Spinal anesthesia has been and is widely used. It is most useful in cases in which relaxation is essential. It has been abused in some cases by giving the patient an overdose. The principal advance in respect to dosage has been the estimation of it not in terms of milligrams or grains, but in terms of so many cubic centimeters of a solution of a certain concentration. Prepared solutions of local anesthetics are more convenient to use than other preparations. They are relatively safe for operations below the umbilicus,[9] but they are not so safe for operations in the upper part of the abdomen. Many papers have been written about the clinical application of spinal anesthesia, but less is actually known of the underlying physiologic effects, especially among patients who constitute bad risks, than is known of any other method of anesthesia. Ephedrine, by its elevating effect in blood pressure, no doubt has increased the use of spinal anesthesia; in most instances, ephedrine will counteract the fall in blood pressure that is caused by procaine hydrochloride.[10]

Whatever advance is presented by spinal anesthesia comes about through the use of relatively safe anesthetic agents, and no safer one has yet been introduced than procaine hydrochloride. Recently, local anesthetics of more prolonged action than procaine have been introduced, but as yet no agent with less toxicity has been presented or developed. If an agent can be developed which is a local as well as a surface anesthetic and no more toxic than procaine hydrochloride, it will be a real advance. Pitressin has been suggested as a substitute for epinephrine in local anesthesia.[11] If untoward systemic effects can thus be eliminated and the local hemostatic effect retained, this will also be an important advance.

Medication preliminary to operation has been widely used and abused. Whereas a mild effect is desirable, a profound effect is undesirable. This usually applies to morphine, the barbiturates and tribromethyl alcohol. Preliminary medication should be begun from three to twelve hours before operation, with the idea of eliminating fear and apprehension, and ordinarily not for the purpose of producing analgesia. In surgical cases, drugs of relatively short action that produce sedation are better than hypnotics of longer action. A recent advance in this field is the development of pentobarbital sodium, which, like other barbiturates, is antispasmodic, and for this reason, as well as for purposes of sedation, is advantageously given before the administration of local anesthetics. Tribromethyl alcohol has given considerable satisfaction in the hands of many, but the tendency at first was to give it as an anesthetic, later to give it as a basic anesthetic, and finally, still further reduction of the dose tended to place it in the category with the combination of barbiturates and morphine, by its use more as preliminary medication than as an anesthetic agent.

One improved method in procedures of anesthesia has been designated by the term "balanced anesthesia" wherein one uses small doses of preliminary medicaments and general or local anesthetics.[12] This procedure is particularly valuable to the patient who constitutes a bad risk, and from the standpoint of such patients it marks a decided advance in anesthesia.

In surgery and obstetrics there is little excuse for the adoption of any method as a routine. From the standpoint of the anesthetist, the principal advance in anesthesia has been that many agents and methods are available, and that a safe and satisfactory method or agent can be chosen for almost any type of patient or operation.

Medical cases sometimes offer a field in which an anesthetist may contribute to correct diagnosis or better care of the patient. For example, in tetanus, the intravenous use of the barbiturates, alternating with morphine and magnesium sulphate, has given relief to patients whose symptoms would otherwise have been resistant to control. The contribution has been not to the cure of the disease so much as to the control of symptoms.[13] In asthma, the use of oil-ether by colon has at times apparently been a life-saving measure, when the asthmatic condition has become otherwise uncontrollable.[14] In almost any condition in which convulsions are difficult to control, the barbiturates have been found to be useful; for example, in strychnine poisoning, eclamptic convulsions of pregnancy and meningitis. In certain cases in which pain is most difficult to control, the enduring effects of the barbiturates in large doses have controlled otherwise intolerable pain. Examples are industrial accidents, fatal burns or crushing injuries. The control of pain in war is being studied, and the barbiturates offer a method toward that end. Whereas previously the anesthetist limited himself to the administration of general anesthetics, the present-day anesthetist must be familiar with local anesthetics, hypnotics and analgesics, and must be prepared to supervise treatment by oxygen and other vapors, intravenous treatment or any other method of treatment in which he may be of help to his associates. In cases in which the differential diagnosis is essentially related to the determination of paths

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10. Ockerblad, N. F., and Dillon, T. G.: The Use of Ephedrine in Spinal Anesthesia, J. A. M. A. **88**: 1135 (April 9) 1927.
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of transmission of pain, the diagnosis may be aided by the blocking of nerve trunks to certain regions.[15] In certain nonoperative conditions the anesthetist seems to be the one most fitted to make injections of alcohol for its prolonged effect in control of pain.[16] A recently developed anesthesia study record, including as it does a careful postanesthetic and postoperative check on complications, will in time give facts on which to base definite opinions. Previous records, for the most part, give a basis for impressions only.

In recent years the anesthetist has been given new tools and new substances to use, and he has received valuable support from others, both within and without the medical profession.

Pharmacologists, physiologists and chemists have investigated in their laboratories, and have published results concerning various anesthetics and their effects, and these have been outstanding contributions from the standpoint of the anesthetist. General debility makes the choice of the anesthetic more important than it would otherwise be. In general, from the standpoint of the anesthetist, the greatest advance is the tendency to add the science of anesthesia to the art of anesthesia. As Jevons said: "Science teaches us to know, and an art, to do." [17] By the science of anesthesia, then, I mean knowledge of the facts, principles and developing laws of anesthesia as they relate to the known facts of chemistry, pharmacology, physiology and other fundamental medical sciences. The art of anesthesia is the skilful application of this knowledge in practice. For example, the choice of the best anesthetic agent for a given case rests on a foundation of science; the administration of the agent chosen, largely on skill or art. Increased knowledge and experience, together with skill in the use of anesthetics and allied drugs, has made the anesthetist more useful to his associates, the surgeon, the obstetrician, the internist and the diagnostician, and so he becomes of increasing value to institutions that wish to develop an organization in anesthesia and associated fields. The attitude of many surgeons in encouraging anesthetists has been a great aid to progress in the field.

One of the most striking advances in respect to anesthesia with gas is the refined equipment made by manufacturers of gas machines. They have kept pace with the changing demands as new anesthetic agents and time introduced new technics. They have cooperated with anesthetists in carrying out their ideas. The first of modern gas machines was made in 1923 by Foregger with a separate control each for nitrous oxide, ethylene, oxygen, carbon dioxide and ether.[18] Further contribution in a mechanical way has been the development by Waters [19] of the use of the soda-lime absorber in connection with gas anesthesia. This has reduced the cost of the administration of gases or other anesthetics by inhalation to the lowest practical level.

In nonsurgical cases, there are the advantages of the new Drinker machine for artificial respiration, and patients with surgical conditions now have available to them a new type of apparatus on which I have been working for ten years.[20] This apparatus can be used in connection with the intratracheal tube, and sometimes an inflatable vest can be employed.

The manufacturing chemist, although he, like the rest of us, is in business to make a living, should also, like the rest of us, be given his share of credit for the development of new substances that allay or abolish pain, and for establishing and maintaining a high standard of quality of his products. It seems to me that particularly worthy of praise are those manufacturers who, having developed a new product which they have every reason to believe is beneficial and innocuous, delay putting the product on the market until experienced physicians, in actual practice, have been able, by means which are safe for patients, to confirm the findings of the manufacturers.

Opportunities for anesthetists are greater now than before. From the standpoint of economics the field of anesthesia is less crowded by members of this association than most other fields and, although more physicians than formerly have been studying anesthesia, this field offers many opportunities, especially for younger men. I think that it would be to the advantage of this association and its members to encourage especially some of the men who have just finished internships to devote their time to this subject. There are opportunities now for such study; previously no courses were offered. Publications dealing with anesthesia and related subjects have augmented the educational opportunities of this specialty. There are now three journals on anesthesia, one published in Germany, one in England and one in the United States. Societies of anesthetists are meeting regularly, and in a short time anesthesiology will be a regular specialty. I hope that this organization will soon recognize it.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DR. LAHEY, DRS. SEEVERS AND WATERS, AND DR. LUNDY

DR. J. T. HALSEY, New Orleans: In the discussion by Drs. Seevers and Waters of the effects of paralysis of the intercostal muscles on the circulation during spinal anesthesia, it seemed to me that perhaps the authors did not emphasize sufficiently the bad effects on the circulation of the failure of the normal respiratory sucking and pressing in the chest which is responsible to so great a degree for keeping up the supply of blood to the heart. I thought that I could read, in some of the charts, a justification for my conviction that the interference with this mechanical factor is a grave thing. It seemed to me that these charts made it clearly evident that artificial respiration by the means of the Drinker apparatus was much more efficacious in restoring and maintaining the blood pressure than was the mere supplying of an extra concentration of oxygen to the patient. The mechanical difficulties connected with the application of that kind of artificial respiration to a surgical patient in the amphitheater are great, I am sure. I was consequently interested in what I took to be an intimation from Dr. Lundy that he is on the way to getting something in the nature of a Drinker apparatus that can be applied only to the chest and so can serve as a really efficient physiologic method of improving the circulatory function in these patients. I should like to emphasize the importance of adopting all means possible to avoid the very rare but usually disastrous ethylene explosions. If I understand the views of Drs. Seevers and Waters and what, it seems to me, they have proved about the state of affairs of the circulation in these high spinal anesthesias, a dilatation of vessels occurs in the splanchnic area, which those authors, in common with others, do not consider very important; there is a dilatation

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16. White, J. C.: Angina Pectoris; Treatment by Paravertebral Alcohol Injection or Operation Based on the Newer Concepts of Cardiac Innervation, Am. J. Surg. **9**: 98 (July) 1930. Woodbridge, P. D.: Therapeutic Nerve-Block with Procaine and Alcohol, Am. J. Surg. **9**: 278 (Aug.) 1930.

17. Webster's New International Dictionary of the English language, Springfield, Mass., G. and C. Merriam Company, 1931.

18. Lundy, J. S.: Ethylene: Its Value in Relation to Other Anesthetic Agents, Northwest Med. **23**: 126 (March) 1924.

19. Waters, R. M.: Clinical Scope and Utility of Carbon Dioxid Filtration in Inhalation Anesthesia, Anesth. & Analg. **3**: 20 (Feb.) 1924.

20. Lundy, J. S.: Adequate and Properly Controlled Artificial Respiration for Surgical Patients by Means of a New Pulmonary Ventilator, Proc. Staff Meet., Mayo Clin. **7**: 225 (April 13) 1932.

of the vessels and a change in regard to the physical conditions in the voluntary muscles through the body which make difficulties for the proper circulation of the blood, and the anoxemia leads to an impaired cardiac output. As a result of what I think is known about the action of ephedrine on cardiac output in some other conditions, I believe we ought to reserve our judgment and be cautious as to how we use it in these patients. Physicians should not feel that ephedrine is so surely a life saver that they can permit themselves to be careless.

DR. E. STARR JUDD, Rochester, Minn.: When I was on the Council on Scientific Assembly, it was constantly put up to us that anesthetists should be given a special section where they could work out their own problems. I opposed this, and I rather think Dr. Lahey opposed it, because we felt that anesthesia is a vital problem to so many different sections that the matters should be presented one year in one section, another year in another section. From my own experience, I think that although there are complications following the use of ether, and that ether is not entirely satisfactory, it is the safest anesthetic at the present time. Shortly after the war, a Parisian expert in administration of spinal and regional anesthesia was invited to the clinic, and we became greatly interested. We had some highly satisfactory experiences, and it looked for a time as though we were going to adopt spinal anesthesia pretty generally. However, after we had made a study of it, we concluded that, in our hands, spinal anesthesia and regional anesthesia were not as safe as ether. Then Dr. Lundy came to us, and since then we have been working constantly to try to find something that will improve spinal anesthesia, for nothing gives such satisfactory relaxation. I think I have saved some lives by using spinal anesthesia in very difficult reconstructions of the common bile duct. I have been enabled to do a much more accurate operation. So I like spinal anesthesia very much and I wish I could use it as much as I formerly thought I could. We had a woman patient with arthritis, cholecystitis and stones. Her general condition was not good, and we used spinal anesthesia. She had a smooth anesthesia, and an uneventful afternoon and night. The next morning, the blood pressure kept dropping. We supported her, but she did not improve, and died in two or three days. Necropsy revealed no cause of death. I don't know whether the spinal anesthetic was a factor, but I have always thought that if we had given the woman gas and ether she might have lived. In a period of ten years I had another similar experience. Finally, I gave up spinal anesthesia for abdominal work, much as I disliked to do so. It is the late effects, not the immediate effects, that have made us give up spinal anesthesia for abdominal surgery. If we can find either some drug or some instrument that will allow the same relaxation and ease of operation as we could obtain with spinal anesthesia, we shall have accomplished a great deal.

DR. A. M. CAINE, New Orleans: We are not troubled in this city with the anesthetic problem of the referring physician, but we are faced with the hospital technician whose one excuse for existence, from the hospital point of view, is that money may be made for the institution. The money thus made by the institutions employing technicians, thoughtlessly employed by the surgeon, seems to be a favorite theme at meetings of superintendents of hospitals. The practice is a hindrance to advancement in anesthesia, driving our best young men from engaging in the specialty. In his remarks on evaluation, Dr. Lahey has emphasized a most important point. Personal examination and follow up are most desirable; in fact, they are essential, for enthusiasm on the part of the anesthetist. We as anesthetists want to thank our friends who do so many patient hours of research work to prove or disprove a theory. They are our right hand in research.

DR. H. M. TRUSLER, Indianapolis: As a surgeon I am unwilling to tolerate any routine practice of anesthesia. I am especially unwilling to adopt the routine use of any agent that subjects the patient to the hazard of circulatory collapse or anoxemia. Certainly I regard spinal anesthesia as unsafe for routine use. It is difficult to obtain reliable statistics of anesthesia deaths, but it is probably true that the death rate due immediately to spinal anesthesia is close to 1 per cent. High spinal anesthesia I regard as especially dangerous because of paralysis of the thoracic muscles. It has always seemed to me that this factor greatly increases the hazard of circulatory collapse. From the standpoint of greatest safety under all conditions, if I were forced to rely on just one anesthetic agent, it would have to be ether. Since this is true I prefer to offset the objectionable features of ether by attempting to carry out what Dr. Lundy calls balanced anesthesia, using a combination of drugs in a way which I think will react best for the patient. In this effort I have especially enjoyed the use of the barbituric acid derivatives, and especially sodium amytal. When this drug is used in the proper fashion to produce a partial narcosis, I have found it a most valuable adjunct to anesthesia.

DR. M. H. SEEVERS, Madison, Wis.: In answer to Dr. Halsey, the reason I didn't mention more concerning the sucking and pressing action of the Drinker machine was the realization of the fact that the effect of the normal respiratory variations in intrathoracic pressure on blood movement is still controversial. Dr. Eyster recently has presented a paper indicating that under ordinary conditions the aspiring action of the thorax is of less importance than has been generally considered. We do not know what occurs under the abnormal situation existing in spinal anesthesia. The positive and negative pressures exerted over the whole body with the Drinker machine probably aid in the mechanical movement of blood. As far as the use of ephedrine is concerned, I think it has been fairly well demonstrated that small doses increase cardiac output. Chen and Meek were able to demonstrate this increase. If the dosage is large, the output is diminished. Our own results, both in the laboratory and in the clinic, have been obtained with doses that will maintain the original blood pressure. Our results have been good provided the tissues are adequately oxygenated. Ephedrine depresses the conduction bundle, and if the heart is anoxic, as the result of diminished circulation of blood, it may act only as a cardiac depressant.

DR. JOHN S. LUNDY, Rochester, Minn.: With regard to the increased output of the heart with ephedrine, in our experiments, in which the blood pressure was reduced tremendously and then elevated with ephedrine given intravenously, there was a marked increase in the pulse pressure for a period of about thirty minutes. This effect in increased pulse pressure could be terminated immediately by section of the vagi or could be stopped by the administration of a large dose of atropine. I simply wish to add this observation since the question has been raised about the output of the heart in connection with the use of ephedrine. With reference to Dr. Judd's remarks concerning delayed untoward results of spinal anesthesia, I am afraid he may be right. I can produce under certain circumstances, without exception, permanent cord changes from the use of solutions of procaine hydrochloride given intraspinally, and the picture that is seen through the microscope checks closely with that of the paralysis which is seen in observing an experimental animal; the animal dies invariably from four to ten days afterward. The point is not proved, I appreciate that, but it will be recalled that for many years the controversy raged—were there or were there not delayed untoward results from the use of chloroform? Finally it was decided that there were. I am afraid we are going to go through the same cycle with regard to spinal anesthetics.

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**Origin of the Name Syphilis.**—Fracastorius was not only a physician, poet, mathematician, physicist, and astronomer, but also a geologist who saw fossil remains as the bodies of prehistoric plants. He died in 1553 of apoplexy. In 1559 a statue was erected in his memory at Verona with a eulogy of the author of "that divine Poem Syphilis." This poem, written, as he says, in his lighter moments, brought him more fame than all of his scientific writings. It appeared first in 1530 and was dedicated to the illustrious Cardinal Bembo, his old friend and classmate at Padua. The following selection from the third book relates the legend of the shepherd Syphilis, who, for an act of impiety, was struck with the French disease. This poem became so famous that the word syphilis soon became the universal term for this disease and displaced all other designations. —Major, R. H.: Classic Descriptions of Disease, Springfield, Ill., Charles C. Thomas, 1932, page 37.

# INDUSTRIAL DERMATOSES

## WITH SPECIAL REFERENCE TO ALLERGY AND MYCOTIC DERMATITIS

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Within the past few years research work and clinical investigation have entirely changed certain aspects of industrial dermatoses. We refer particularly to the work of Jadassohn,[1] Bloch [2] and his co-workers, Sulzberger and Wise,[3] and Sulzberger [4] in the demonstration of the fundamental importance of allergy in the production of dermatitis or eczema, particularly by the employment of the patch test and the passive transfer method of Prausnitz and Küstner in their investigations. Alderson [5] has called attention to the dilemma in which the Industrial Accident Commission of California was placed in considering a case of sensitization to turpentine and paint. The questions asked of Alderson and his committee by the Industrial Accident Commission illustrate the necessity for a clarification of our ideas on this subject. This refers to general physicians, industrial physicians and, particularly, to dermatologists who may be called in consultation. The second aspect of industrial dermatoses to which we wish to call attention is that of mycotic dermatitis.

### ALLERGY AS RELATED TO INDUSTRIAL DERMATITIS

There should be a clear understanding of just what is meant by the term "allergy." We believe that Bloch's definition is the best at the present time, namely:

> Allergy is that state which has as its basis the property of certain groups of cells (organs) of the living organism to react in a specific manner when brought in contact with a substance, which is, as far as is known, foreign to the organ or cells: the characteristic of this specific pathologic process lies in the fact that it is caused by the reaction of this exogenous substance with its specific cellular fixed anti-body. The basis and the essence of allergy is the ability of the living cell to react with the production of specific anti-bodies to the stimulus of foreign substances which are therefore called antigens.

The term idiosyncrasy so frequently heard is one which in the light of recent experimental work loses much of its former meaning. Idiosyncrasy used medically means a peculiarity of constitution, and a person who reacts to poison ivy is said to be idiosyncratic. In view of the fact that it has been shown experimentally that 80 per cent of all persons are allergic to Ascaris,[2] 60 per cent to poison ivy,[6] and 45 per cent to orthoform,[7] and that by using a concentrated extract of primula Bloch [2] was able to produce an allergic state in the skin of 100 per cent of persons, the question arises, Where does idiosyncrasy end? If 60 per cent of people react to poison ivy, certainly it cannot be said that they exhibit a peculiarity of constitution and that the 40 per cent of persons are normal. It is our firm opinion that the term idiosyncrasy signifies little and leads to confusion. We also agree with Highman [8] that the designation "allergic dermatitis" should not be used. The person, and not the dermatitis, is allergic.

For the sake of brevity we list the following facts, which have been shown by experimental and clinical investigation to be of importance in the consideration of industrial dermatitis due to allergy:

1. Allergy can be brought about by substances of a nonprotein as well as of a protein nature.

2. The location of the allergy may be in a circumscribed area of the skin, such as the dorsa of the hands or forearms, or it may be present in the entire cutaneous surface or in all the organs and tissues in the human body. In industrial cases it is well to remember that the allergic area may be localized to certain parts, particularly to the hands and forearms.

3. The eczema tests of Jadassohn and Bloch, or, as they are called in this country, "patch tests," are superior to all others in the demonstration of a cutaneous allergy.

4. Stauffer [9] has shown that substances with a high hydrogen ion concentration produce a greater reaction than those with a neutral reaction. This observation may be of great future importance.

5. Bloch and Steiner-Wourlisch [10] demonstrated in their experimental work in producing sensitization to primrose extract in guinea-pigs that there was a so-called "incubation period" of from seven to ten days between the first application of the primrose extract and the appearance of an allergic reaction when tested. Percival,[11] in his work on paraphenylendiamine called this the "latent period." We believe "latent" to be a better term than "incubation."

6. Bloch and also Stauffer have been unable to demonstrate antibodies in the blood serum of patients with eczematous eruptions due to allergy by the method of Prausnitz and Küstner. Bloch emphasizes this fact as differentiating eczematous manifestations of allergy from hay fever, asthma, urticaria and eruptions due to drugs. He suggests the possibility that the antibodies are fixed in the cutaneous cells and do not become free in the blood stream. This point is of extreme importance in the consideration of therapy and further research, and may explain the refractoriness to desensitization of dermatitis due to allergy. Yet, Ramirez and Eller,[12] in 1930, reported three cases of dermatitis due to ragweed, four to silk, one to cat hair, four to horse hair and one to paraphenylendiamine in which they successfully produced a passive transfer. They did not state whether the reaction of the passive transfer test was of an urticarial or an eczematous nature, but, suffice it to say that, so far as we can discover and according to Bloch, no cases of positive passive transfer of an eczematous nature occur in patients with a dermatitis due to exogenous substances.

7. Although specific antibodies have not been demonstrated in the blood serum of a patient suffering from a dermatitis due to allergy, it has been demonstrated many times that this allergy is specific for the particu-

Read before the Section on Dermatology and Syphilology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

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lar substance or chemical, and that other substances or chemicals unrelated to the particular one causing the dermatitis will not produce a like reaction unless the individual is also specifically allergic to those substances or chemicals. This fact is of the utmost importance in industrial dermatoses. A dermatitis due to sensitivity to turpentine developed in a workman while working in a paint shop. He was forced to seek employment elsewhere when he recovered from the original dermatitis. He found work as a carpenter, and in a few days a new attack of dermatitis exactly similar to the original one developed. This second attack of dermatitis was said to be due to the fact that the first attack of dermatitis sensitized the skin to many different irritants. As a matter of fact, investigation showed that while the man was working as a carpenter he handled wood products on which turpentine had been used, and that he reacted violently to a patch test of turpentine.

In our study of industrial dermatoses due to allergy, we have reviewed two hundred and sixteen cases seen during the past five years, which corresponds to the period during which we have been performing patch tests as a routine in every case possible. For brevity we have grouped these cases, in order to bring out the particular points that we wish to stress.

GROUP I (One Hundred and Four Cases).—In the spring of 1931, a large rayon plant suddenly decided to change the composition of an oil used in the winding department from a nonsulphonated oil to a new sulphonated oil. About two hundred workers were employed on these winding machines, and their hands were constantly bathed in the oil. Nothing happened for three days, when a young woman reported a mild dermatitis of the face, neck, hands and arms. These cases rapidly multiplied during the succeeding ten days, until at the end of two weeks this dermatitis had developed in one hundred and four workers. Careful investigation of these cases showed the following facts:

1. All workers were exposed simultaneously.
2. The latent period varied from three to fourteen days, when the experiment ceased.
3. As new cases were appearing every day, it appeared probable that a much larger number of workers would have become sensitized to the oil.
4. Patch tests were strongly positive in all persons showing the dermatitis.
5. Two workers presenting normal skins were tested daily up to the time the dermatitis developed. The patch test became positive simultaneously with the appearance of the dermatitis on the exposed parts.
6. Three of these workers tested with ultraviolet light showed a markedly increased sensitivity.
7. Since this company has resumed the use of the oil formerly used, there have been no further cases of the aforementioned type.

GROUP II (Fifteen Cases).—In the summer of 1931, within a period of four weeks, in 15 linemen working for the Niagara Hudson Corporation on the high tension lines dermatitis of the hands and wrists developed, which varied from a mild erythema to severe bullous dermatitis with extension to the face and neck. Through the courtesy of Dr. H. J. Constantine of the Niagara Hudson Corporation, we were able to study five of these cases carefully, as well as to make tests in a number of linemen who did not develop the dermatitis. It was found that the cause was a new brand of rubber gloves which the linemen always wore while working on the high voltage lines. Investigation of these cases showed the following points of interest:

1. The dermatitis did not develop until after the new gloves had been worn for several days. The gloves were worn for a varying period each day, that is, from one hour to all day, in other words, there was a definite latent period.
2. Patch tests, with both old and new gloves, on linemen in whom dermatitis had not developed were negative. Patch tests with rubber removed from the new rubber gloves were uniformly positive in all five patients with the dermatitis.
3. Through cooperation by the company producing the gloves, it was finally demonstrated that the sensitivity was due to tetramethyl-thiuram-disulphide.
4. By changing the brand of rubber gloves, only a single lineman continued to have trouble. He had evidently become so sensitized that he reacted to the smaller quantity of the sulphur compound present in gloves which he had formerly used with immunity.

GROUP III (Eleven Cases).—These patients were florists; 10 of them were found to be sensitive to chrysanthemums or pompoms, both of which they had handled many times previously. The other case was found to be due to sensitivity to tulips. This patient had handled tulips for many years before showing signs of dermatitis.

GROUP IV (Twenty-Six Cases).—In 1927, a large aniline company suffered a severe explosion in one of its buildings devoted to the production of key materials such as nitrosophenol. Approximately 110 pipe fitters were employed to rush repairs to this building. Nothing happened for four days, and then one pipe fitter after another appeared with a severe dermatitis of the face, neck, hands and arms, which investigation showed to be due to contact with the chemical dust that had collected for years on the many pipes in the building. In these cases a definite period of latency was demonstrated.

GROUP V (Eight Cases).—These patients worked in a chrome-plating establishment. A change was made in the apparatus used, and the men were exposed to cyanide fumes. There was no trouble for three days, when five men complained of a mild dermatitis on the face, neck, hands and arms. In this instance again a definite period of latency was demonstrated.

GROUP VI (miscellaneous group: Thirty-Nine Cases).—In this group there were patients from many different industrial plants in and around Buffalo. There were four patients showing a positive patch test to paranitrosodimethylaniline, a chemical used as an accelerator in the curing of rubber, two patients from a rubber company with positive patch tests for sulphur powder, four patients from a chemical plant who gave positive reactions to nitrosophenol, and three other patients from the same plant, with positive tests for dinitrochlorbenzol. Other cases consisted of sensitivity to "flytox," varnoline, mineral spirits, kerosene, benzene, turpentine, acetone, xylene, crude coal tar, potassium cyanide, formaldehyde, thymolac, laundry chemicals, cleaning chemicals, soap, podophyllin, flour dust, duco and procaine hydrochloride. The remaining patients in this group were not tested, owing to a lack of cooperation either on the part of the company employing the patient or on the part of the patient himself.

At this point it is well to mention the fact that it is not always the fault of the physician that the cause of

the dermatitis is left undiscovered. All too frequently the executives of the plant are unwilling to allow a careful investigation by the dermatologist to discover the exact cause of the dermatitis. Frequently the employee is taken back to work after the dermatitis has subsided and within a short space of time is discharged, because the company feels that there is too great a risk of paying further compensation by keeping the man around the plant. This is not generally true in our experience with the large companies. With the newer knowledge heretofore mentioned, it is distinctly up to the industrial physician and the consulting dermatologist to educate the executives of industrial plants regarding the great importance, not only to the company, but to the employees, of ascertaining the exact cause of the dermatitis. We can recall, in our experience, a considerable number of workmen who have drawn compensation for months and even years after having left the employ of the original plant in which the dermatitis first developed.

The technic of the patch test has been well described by others and need not be gone into here. The work of Stauffer [9] in Bloch's clinic is classic. In forty-eight of forty-nine industrial cases he was able to find the exact cause. We have been unable to match this percentage, owing at times to our own carelessness but usually to a lack of cooperation on the part of the industry or the patient. Industrial commissions and insurance companies should be acquainted with the advisability of determining the exact cause of any industrial dermatitis by means of the patch test.

The questions of compensation and permanency of disablement always enter into consideration. The cases divide themselves into the following groups so far as compensation is concerned:

1. Cases of mild dermatitis in which the cause is readily discovered, result either in no loss of time or a loss of time less than the law requires as a minimum for compensation. In New York State this is seven days. Such cases occasion no trouble.

2. Cases of a severe grade of dermatitis in which the cause is discovered and preventive methods are successful. These cases also present no difficulty from the angle of compensation.

3. Cases of moderate or severe dermatitis in which the cause is not found and the patient is discharged soon after he resumes work. These cases are too numerous and are usually a reflection on the sincerity of the industrial company.

4. Cases of severe or moderate dermatitis occurring in employees who may have worked for many years in responsible positions. Allergy has developed suddenly for which nothing can be done, in spite of the fact that the employee is a valuable man to the company. Usually such men are eventually forced to resign or are discharged, and must seek work elsewhere at greatly reduced salaries. These are sad cases and always occasion a sharp contest in the industrial court. In our opinion, such workmen are entitled to a certain amount of permanent disability compensation. From the facts cited heretofore in the literature and from our own experience as detailed in such persons, sensitivity develops from repeated contact with the particular antigens in question. If we were to answer the questions submitted to Alderson [5] and his committee regarding a case coming under this category, we would be forced to answer the questions as follows:

1. The first attack of dermatitis was caused by repeated previous exposures to the particular antigen.

2. There is a great deal of evidence to show that over 50 per cent of persons will react to a given antigen if repeatedly exposed to it.

3. Susceptibility to allergy is increased by repeated exposure.

4. Our impression is that in young persons with relatively thin horny layers allergy develops more rapidly than in an older person, other conditions being equal.

5. Susceptibility to allery is increased at a greater rate by repeated exposure than by age.

6. There is no positive experimental evidence that repeated attacks of dermatitis increase the susceptibility to allergy.

Regarding the cure of patients with allergic dermatitis, we have been unable to effect a cure in any case by any means at our disposal, including the intracutaneous and subcutaneous injections of gradually ascending doses of the particular chemical in question. We have observed a gradual lessening in sensitivity from lapse of time alone in a few cases that we were able to follow. We believe that the absence of free antibodies in the blood serum is the explanation of the refractoriness of these patients to treatment by desensitization.

### MYCOTIC DERMATITIS IN INDUSTRY

So much has been written in recent years on eczematoid ringworm, fungus dermatitis, epidermophytosis or mycotic dermatitis, whichever term happens to be used, that physicians in general and industrial commissions are becoming well aware of this form of eczema or dermatitis. It has seemed to us that the diagnosis of a mycotic dermatitis has at times been made without sufficient evidence. As has been pointed out repeatedly by such men as Pusey [13] and Bloch, there is no difference pathologically between a mycotic dermatitis and a dermatitis due to some external irritant. Furthermore, it is frequently impossible to distinguish these two types of dermatitis clinically. We believe that before a diagnosis of mycotic dermatitis is made, the following points should be considered:

(1) A history of preexisting dermatitis in areas characteristically involved by superficial invading fungi, such as the toes, the groin and the interdigital spaces of the fingers. Referring to the latter, we have been misled several times by the appearance of vesicles in the interdigital space between the first and second fingers of the left hand of dentists. A diagnosis of dermatitis due to procaine hydrochloride should seldom be made unless proved by a patch test.

(2) Clinical evidence of preexisting chronic foci of fungus infections. Too frequently, the toes, groins and perianal regions are left unexamined when a persistent dermatitis on the hands is being considered. Repeatedly we have found an active vesicular ringworm infection of the feet in patients with a supposed industrial dermatitis of the hands.

(3) Smears and cultures, when positive, are of marked assistance. In approximately one half of the cases of known mycotic infection, such examinations are negative. We believe that a careful clinical history and examination are generally of more value than smears and cultures. A period of observation of from two to four weeks is extremely valuable in many instances in making a definite diagnosis of mycotic infection.

(4) We have frequently found that it is necessary to rule out the question of a dermatitis due to allergy by

13. Pusey, W. A.: The Principles and Practice of Dermatology, New York, D. Appleton and Company, 1924.

various patch tests before arriving at a diagnosis of mycotic dermatitis. In going through our records, we found that thirty-two patients of a total of one hundred and seventy-five showing evidence of mycotic infection presented, in addition, a dermatitis due to allergy to some particular chemical. Frequently, an industrial dermatitis superimposed on a chronic mycotic infection of focal areas produced a marked flare-up in the mycotic dermatitis. The following case is an excellent example:

A worker in an aniline company suffered a severe attack of dermatitis due to allergy to dinitrochlorbenzene. He recovered from this dermatitis in about three weeks, chronic areas involving the palms, groins and feet persisting. This dermatitis caused him to receive compensation for about eight months, during which time and for periods of several weeks, he was many miles distant from the plant. Examination of him at this time revealed a characteristic mycotic infection of the areas previously mentioned, with positive smears and cultures. The dermatitis was properly treated, and in a few weeks he returned to work. A severe exacerbation of the dermatitis on the hands, including the palms, dorsal surfaces and forearms, developed. Patch tests showed him to be extremely sensitive to dinitrochlorbenzene.

(5) Every industrial physician and dermatologist should investigate each case of so-called eczema of the hands occurring in an industrial plant with which he is connected. We have had a number of interesting experiences along this line. In one instance, it was found that six cases of ringworm of the hands in chemists, all handling the same reagent bottles, developed from contact with another chemist with a chronic recurring eczema of the hands.

Because of its increasing prevalence, the question of whether a given case of mycotic infection is compensatable is receiving more and more attention in our industrial courts. We have found that the most exacting examination and history as previously outlined is necessary in order to answer the questions propounded in the industrial courts. We believe that mycotic dermatitis is compensatable:

1. When the source of infection can be proved to be a contact in the same plant, as in the case of the chemists previously mentioned.

2. When an industrial dermatitis or injury predisposes to the exacerbation and spread of a chronic mycotic infection. This comes under the category of aggravation, a subject that is so common in industrial courts at the present time. The compensation should end when the primary acute dermatitis has subsided and only the chronic foci remain.

We believe that a chronic, recurring mycotic dermatitis, aggravated by heat and moisture, should not be compensatable, because these factors are common to all industry. Seventy-five per cent of the cases of mycotic dermatitis in industry fall in this category, and usually a claim for compensation is made by the person so affected. It behooves every industrial physician and dermatologist to investigate such cases thoroughly and to establish a diagnosis beyond doubt. We emphasize again that, from clinical inspection alone, it is sometimes impossible to differentiate a mycotic infection from an industrial dermatitis due to chemicals. In times of economic depression and resulting unemployment, the presence of a mycotic dermatitis of the hands is a ready excuse for claiming compensation. With the widespread prevalence of this infection among the general population, it is not at all strange that many cases should appear among workingmen.

## COMMENT

In this paper we have attempted to cover the two most important phases of industrial dermatoses, namely, dermatitis due to allergy and mycotic infection. Ninety per cent of industrial dermatoses fall in these two categories. The advance in our knowledge in the past few years has been sufficient to change greatly our concept of these two phases of industrial dermatitis. There have been many controversial problems that can be definitely settled.

The era of immediate or snapshot diagnosis in any case of industrial dermatitis has definitely passed. To examine a patient properly and to diagnose a case requires a great deal of time, patience and a certain amount of inquisitiveness and detective ability, as well as the proper laboratory facilities. Large collections of substances used in industry must be kept on hand for patch testing. Proper laboratory facilities must be available for mycotic studies. In our opinion, the time and energy spent in determining the exact cause of a given case is well worth while. In fact, from the standpoint of the dermatologist, nothing is more satisfying than the solving of a group of difficult cases of industrial dermatitis.

Lastly, the economic side of industrial dermatitis due to allergy and mycotic infection is of vast importance. It is apparent to any one familiar with industrial court cases that large sums of money could be saved by industry if a prompt diagnosis, backed by a scientific proof, were made, and the proper preventive measures were instituted. In the long run, it is the employee who benefits the most. No honest workman desires to live on compensation and be deprived of his full earning capacity, not to mention the weeks and months of suffering due to dermatitis. If a change in occupation is found necessary, the sooner it is accomplished the better for all concerned.

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## ABSTRACT OF DISCUSSION

DR. C. GUY LANE, Boston: I subscribe to the authors' statement with regard to the localization of sensitization in the cutaneous cells. I remember well the first case of procaine hydrochloride dermatitis I saw in which the skin tests were positive on the patient's arms and negative on the body, lips and mucous membranes. Later tests on the arms at the sites of the previous tests gave stronger reactions than the early tests. I also agree that the patch tests are the best method available at present. I was interested to hear of the positive skin tests at the time of the onset of the dermatitis. The latent period, I think, is of extreme importance, for one has to go a little further back in the histories to get the pertinent facts in individual cases. In regard to specific sensitization, it has been my belief for some time that one attack of dermatitis has lowered the skin resistance to other types of irritation. Perhaps I shall be a little less sure of this after hearing the amount of evidence the authors have brought up regarding specific sensitization. At the same time, I am reminded of the work of Gardiner, in Edinburgh, who reviewed his cases of industrial dermatitis and found two predisposing factors which were important: first, the history of a preceding dermatitis, and, second, a recent intercurrent illness seemed definite predisposing factors in his group. I have not felt that these factors were as large in the group I have seen, but I have felt that they have played a part. I am glad that the advisability of disability in connection with skin cases was emphasized. I think many industrial firms and some insurance companies fail to recognize that disability can be produced in the skin in the same way that it can be in eye and bone injuries sustained in industry. I also believe that repeated attacks of an industrial dermatosis definitely increase the sensitization of the individual and therefore increase the total disability. I have felt that "dermatophytosis" is a little better term than "mycotic

dermatitis" because these cases, if they are proved cases, will need to be classified as infectious skin disease rather than as a dermatitis or eczema. The cases that I have seen with regard to compensation because of a fungous infection I have attempted to classify in five groups: (1) primary cases, which are unusual in industry; (2) cases in which industry contributes to the exaggeration of a fungous infection and increases the disability; (3) cases which start as true industrial dermatoses and then are complicated with a fungous infection; (4) cases in which the patients are sensitized by a fungous infection, though I am not absolutely sure this group exists, and (5) cases in which there is no relationship.

DR. HARRY E. ALDERSON, San Francisco: This paper covers some phases of a subject that is becoming increasingly important, with the growth of health and accident insurance and the rapid spread of a disease that might be called "compensationitis." A high percentage of alleged occupational dermatoses may be mycotic infections or other dermatoses, not necessarily industrial. The certainty that many cases originate at home or away from the job, or that they are at least aggravated by outside factors, complicates the situation. It would pay executives to have home investigations made in many cases. I have been skeptical about turpentine sensitization, believing that it existed but that many reported examples were not truly allergic. This applies also to many other nonprotein substances that in themselves are essentially irritating or cauterizing in their action. Since publishing my paper, I have heard of many cases. My report was more or less in the nature of a challenge and a call for help, and I am pleased with the response. One must be on guard, however, in using patch tests with substances that are in themselves usually irritating, particularly when the suspected material is covered with an impermeable substance such as rubber. It even applies when solutions are merely sprayed or rubbed into the skin. The relationship of mycotic infections to industry is important, and here knowledge of the patient's home environment and habits is of particular value. Irritating substances to which one with a nonindustrial mycotic dermatosis is exposed will often render the condition acute and more or less disabling. Naturally, such cases for the time being are industrial. I have had many such cases. Two women with chronic, dry, mycotic infection of several finger nails were referred to me by the California State Compensation Insurance Fund. Their nail troubles were of several years' standing. Their work exposed their hands to sugar solutions for several hours daily. One patient presented also an acute paronychia around several nails. My ruling that only the latter case was to be regarded as occupational and treated until the acute disabling inflammation subsided was accepted by the company. My recommendation that the other case be rejected was likewise accepted. In my opinion there is no branch of practice that calls for greater training, experience and skill than is required of dermatologists in handling these cases. Perhaps some day the insurance carriers will realize this fact. Some of them already have found that it really pays them to call in a specialist early.

DR. HARRY FOERSTER, Milwaukee: The recognition of the existence of a latent period in the development of a dermatitis is important in compensation cases. A dermatitis venenata or an infectious eczematoid dermatitis may develop following the healing of an injury. The question that arises is, What relation does one bear to the other? The intact horny layer being a natural defense against chemical irritants and infections, a break in this defense as a result of a minor occupational injury may result in a major disability-producing dermatitis, and failure to recognize the existence of a latent period in the development of such a dermatitis may result in an erroneous interpretation of the question of liability. In consideration of the prevalence of epidermophytosis, it is likely that many patients with occupational dermatoses of the hands may have previously had epidermophytosis infection or epidermophytid inflammation of the hands. It is possible that such a condition, if proved to have shortly preceded the development of an occupational dermatitis, may be considered as having produced a local hypersusceptibility to the occupational disorder; also that a localized active epidermophytosis may cause a general hypersusceptibility to other types of inflammation and predispose to the development of an occupational dermatosis.

DR. JEFFREY C. MICHAEL, Houston, Texas: In Texas we have the same problem that Dr. Foerster mentioned, because we have no compensation for industrial dermatoses. However, we have the difficult question to answer whether the dermatitis that follows an injury is compensable as an accident. One of our problems is gasoline dermatitis. Gasoline is a primary irritant and there seems to be no satisfactory diluent. I have tried to work out a contact test for this substance which would be reliable. On myself as well as several other normal controls I have found that gasoline under an impermeable contact test produces an irritation after fifteen minutes' application. Therefore with gasoline I am at present following the usual technic for contact tests but leaving this test on for only twelve minutes. I should like to know whether others have worked out a solution of this problem. With regard to the cases of mycotic dermatitis, in the transactions of the Copenhagen congress there is a discussion by Keller of Freiburg on the paper of Matras in which it is stated that in the vesicular type of fungous infections those vesicles having an acid content never show fungi. During the past summer I tried this out in about sixty cases and found that Keller's statement was correct. My experience showed that the vesicles with alkaline contents might or might not show fungi. Of course, these results ought to be corroborated; but it now seems fairly certain that a good deal of time can be saved by discarding the vesicles with acid contents and examining only those that are alkaline.

DR. LESTER HOLLANDER, Pittsburgh: There are two points of information which I should like the authors to give. First, if the definition of allergy as stated by Doerr is correct, that it is a reaction different from the normal, occurring in a minority of individuals, is it not questionable whether dermatitis produced on this basis in industry is compensable or not? The specific substance that produced 104 cases of dermatitis in the series of Drs. Osborne and Putnam cannot be classed as an allergy producer. I would class it as a strong irritant, which undoubtedly would cause a dermatitis in most individuals and unquestionably should be compensable. The second point with regard to industrial dermatoses was brought up by Oppenheim of Vienna at the Copenhagen congress; namely, that not only specific substances but the manner in which certain work is performed is a factor in their production; for instance, the rolling motion of the hands in the bakers. I wonder whether the authors can throw light on this question.

DR. BEDFORD SHELMIRE, Dallas, Texas: In a suit for compensation in a case of occupational dermatitis, the question arises as to whether the individual developed the sensitization from daily exposure to the exogenous substance in question or was already sensitive when he began the occupation. If the sensitization developed from exposure to some substance encountered in his work, the injury is certainly compensable. Theoretically it appears that individuals do become sensitized by repeated exposure to irritants encountered in their work. Practically this has not been the case in my hands, for attempts to sensitize individuals by repeated exposure to turpentine, gasoline and the like have met complete failure. On the other hand, I have easily sensitized individuals to poison ivy (radicans). It has been conclusively shown that specific hypersensitiveness to poison ivy develops only after previous contact with the plant. It is a recorded fact that the Eskimos of Baffin-Land are not sensitive to the extract of the ivy plant. As the ivy plant does not grow north of the mouth of the St. Lawrence river, these natives in Baffin-Land have never received a sensitizing exposure. The American Indians, who are believed to be closely related to the Eskimos, have been found by many observers to be as frequently subject to ivy sensitiveness as are the white people. New-born infants without exception have been found nonsensitive to ivy. When these infants were tested some weeks following the initial or sensitizing dose, they were found sensitive in about the same percentage as adults. From these observations one is inclined to believe that certain individuals become specifically sensitized to substances encountered in their work.

DR. N. P. ANDERSON, Los Angeles: One must be most cautious in expressing an opinion regarding compensability in many cases. In the case of the workers in the rayon plant cited by the authors, where some 100 of the employees developed a dermatitis following the use of a new type of oil, I

think that there can be no question as to the cause or the compensability. However, let us suppose that only one worker out of the 200 or more exposed developed a dermatitis and that he reacted positively to the patch test of the oil. We would still probably maintain the position that such a dermatitis was compensable. However, let us look at the other side of the question. The dermatologist uses ammoniated mercury a great deal. Suppose now, a patient to whom a 2 or 3 per cent ammoniated mercury ointment was prescribed develops a severe local dermatitis that can be proved to be due to the ammoniated mercury ointment; or let us go further and say he develops a generalized exfoliating dermatitis and requires hospitalization for a month or so. In such a case, and one that can happen to any one of us, do we hold ourselves responsible for the condition? Are we willing to pay the patient's hospital bill? If one of our stenographers develops a dermatitis due to carbon paper, should we be held responsible? If a severe and disabling eruption occurs after a hair dresser or beauty shop operator applies an aniline dye for cosmetic purposes, is the hair dresser to be held responsible for such a condition? I do not know the answers to these questions but feel that one should exercise great caution in expressing opinions. In a recent paper, as yet unpublished, the statement has been made that out of some 280 cases of suspected industrial dermatitis, less than 5 per cent of them were actually due to an industrial irritant. I believe this percentage is much too low and should like to ask the authors, In what proportion of all their industrial dermatoses did they prove the cause to be an irritant of occupational nature?

DR. FRED D. WEIDMAN, Philadelphia: The fact should not be overlooked that fungi can arrive on the patient's skin as the result of contact with raw materials used in industry. I bring the point up as a text to illustrate that it is necessary to have a complete perspective of the biology of fungi in epidermophytosis if one would be equitable to employee and employer alike. A slight knowledge of the habitat of dermatophytes in nature has been obtained. It has been shown that these organisms can not only exist but grow on such things as straw, hay, feathers and leather. Kingery has shown that a fungus of pears is associated with canner's dermatitis in the Northwest. In California, a monilia of oranges induces dermatitis in orange packers. In Formosa, an organism was present in the stalks of hibiscus, a plant which entered into the fabrication of flax and which induced a dermatitis. From a different angle, it is known that diabetes predisposes to certain fungous infections. Dogs with diabetes are susceptible to oidium infection, whereas nondiabetic dogs are not. A problem that came up in a Massachusetts case concerned a person who had both a turpentine dermatitis and a mycosis. The question was whether the mycosis was superimposed, and I understand that is an important point in law. This is a vital point, on which the dermatologist can be of great service. The point is the early examination of these patients to discover whether, *early in the course of the difficulty*, a fungus could be demonstrated.

DR. HAROLD N. COLE, Cleveland: The time element must always be considered in connection with these cases. Many times it is difficult to decide whether it is an industrial condition or whether it is something these individuals are coming in contact with in their daily life. I will mention a couple of instances. A stenographer came to us with an eruption of the face and neck which came and went. It was apparently not from carbon paper, the Sunday newspaper or anything she was using on her skin. Finally she told us one day that the process appeared at the same time the young man she was engaged to had been to see her. On investigation we found that this young man was using a hair tonic on his scalp. We had him come in, made a patch test and applied it to the patient, and found that the eruption was due to resorcinol, which was in the hair tonic. The time element may come in and we may find many of these cases due to something in the patient's daily life. In the case of a man with an eruption over the face and hands, it might have been due to something connected with his business but we could find no explanation. He went to California and there everything disappeared, but when he returned to Cleveland everything started up again. Further investigation of his home conditions disclosed that he was coming in contact with the offending agent there in the form of orris root used on his wife's hair.

DR. EVERETT S. LAIN, Oklahoma City: Had any members of the dental profession been present today and heard these discussions, they would have been first amused and then edified. They have for a long time had under discussion rubber as a basic dental material cause for troubles in the mouth. They are of the opinion that there is a possibility of oral mucosa irritation caused by sulphide of mercury, which gives the rubber the red appearance; also sulphur, which is used for hardening. They have concluded that most of the trouble is due to lack of proper curing. Many dentists recommend that dental plates be immersed in soda water during the night. They have learned by experience that it keeps them in better condition. I have learned that this irritation is more likely to occur in a mouth that is excessively acid rather than alkaline.

DR. EARL D. OSBORNE, Buffalo: I shall confine my remarks to a few of the questions which have been asked. It has been inferred, by a few of the speakers, that the cases at the rayon plant were examples of irritation and not of true allergy. I would point out again that these workmen had never been exposed to the oil before. Had it been an irritative dermatitis, some evidence of irritation would have been apparent within the first twenty-four hours. As a matter of fact, no case appeared until the third day, and new cases were appearing after two weeks' use of the oil. Furthermore, the individuals presenting the dermatitis showed a positive patch test coincident with the beginning of the dermatitis, whereas it was negative before. Various solutions of the oil were used in testing, that is, from 1:10,000 down to the full strength oil. In at least one individual who was highly sensitive, the test with a fraction of a drop of 1:1,000 dilution of the oil produced a terrific dermatitis. Any one who attempts this work must perfect himself in the technic of the patch test. Dr. Lane brought up several important questions. What is the influence of previous attacks of dermatitis on the development of allergy? Several factors are concerned in this question. A person who has had repeated attacks of dermatitis on the hands and arms from any cause certainly absorbs more chemical into the general system from these areas than a person who has had a normal skin on those areas. But one should keep one's conception of allergy clear and not place the blame for the subsequent dermatitis on the first dermatitis when there is a definite allergic factor which can be elicited by adequate testing. Furthermore, one must always remember group sensitization. For instance, turpentine is only one member of a group of chemicals derived from wood which may be in the same chemical group as a number of other substances derived from the same source. I believe that further observation will show that in every new case of dermatitis due to exogenous substances a latent period will be demonstrated. As to disability compensation, certainly some of these individuals falling in one of the groups mentioned are entitled to a certain percentage of permanent disability. I refer particularly to those who have worked for varying periods of time and suddenly become extremely sensitive to an industrial chemical which necessitates their removal from that particular industry. There is no satisfactory treatment for these cases and just how many of them will clear up in time it is impossible to say. In doing tests with gasoline, we always use just a fraction of a drop, that is, the amount which will adhere to the tip of a wooden applicator stick. This is applied to the center of a small piece of gauze and exposed to the air for about thirty seconds and then applied to the skin with a layer of rubber dam over the gauze. In the case of true allergy, there will be an eczematous reaction more extensive than that due to irritation. Dr. Foerster raised the question of a dermatitis due to allergy following local injuries or bruises. This is a difficult phase for investigation. In the first place, one is dealing with an area of localized tissue sensitivity. If looked for, a definite period of latency should be found between the time of first exposure and the development of the dermatitis. Usually one does not have these patients under observation long enough to test their sensitivity. As soon as the dermatitis disappears, they disappear. In regard to the question of Dr. Shelmire, about whether allergy is acquired or inherited, my opinion is based on my own experience and the literature and is that in practically all cases it is acquired. At least the burden of proof is on those who would prove a congenital allergy.

# SIGNIFICANCE OF IMMUNITY TESTS IN EPIDEMIOLOGY AS ILLUSTRATED IN YELLOW FEVER

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Immunity tests are taking an important place in epidemiologic studies of several diseases of man. In diphtheria, scarlet fever and tuberculosis skin tests are commonly used. In poliomyelitis and yellow fever the serum is tested in animals, in the former by a neutralization test and in the latter by a protection test. If a result indicating immunity is obtained by any of these procedures, it is assumed that the person tested has previously been infected with the corresponding causative agent. Such evidence of a preceding immunizing infection is so frequent in persons who give no history of an attack of the disease under investigation that a high prevalence of unrecognized and subclinical cases is commonly assumed. Another possible explanation would be that the immunity tests are not so specific or so reliable as has been believed.

The specificity of immunity reactions, particularly the Schick test in diphtheria, has been questioned by Friedberger, Bock and Fürstenheim,[1] who showed that the serums of persons or animals may possess certain antibodies—or at least physiologic properties enabling the serums to act on antigens—in the absence of specific immunization. Moreover, such antibodies were found to vary quantitatively with the age of the persons supplying the serum. These observations were presented as evidence that immunity reactions commonly supposed to be due to previous specific infection may depend on nonspecific physiologic factors. In immunity tests for each of the diseases that we have mentioned, including yellow fever in regions in which the disease is endemic or intermittently epidemic, it has been observed that the frequency of the result indicating immunity has, in general, risen with age. This is what would be expected if the immunity tests revealed the cumulative experience of the community with specific infection, but the hypothesis that the reactions may be physiologic maturation phenomena requires careful consideration.

Experiences in which immunity reactions are being obtained in persons who have presumably not been exposed to the specific infectious agent continue to be reported. It was observed by Heinbecker and Irvine-Jones [2] and also by Bay-Schmith [3] that a large percentage of certain Eskimos living in regions in which diphtheria had not been recognized gave a negative Schick reaction. Wells and Heinbecker,[4] however, later found organisms morphologically resembling diphtheria bacilli in the throats of Eskimos.

It has been observed by a number of investigators that high proportions of the population give negative reactions to the Schick and Dick tests in tropical and subtropical regions in which clinical diphtheria and scarlet fever are rare. Doull, Ferreira and Parreiras,[5] for example, obtained such results in Rio de Janeiro, and Parr, Goodale and Krischner [6] did the same in Syria.

A widespread immunity to poliomyelitis, as evidenced by serum neutralization tests, in adults with no history of poliomyelitis has been reported by Aycock and Kramer [7] and others. Recently Soule and McKinley [8] found that the serums from eight residents of Porto Rico, where clinical poliomyelitis is rare, all had the power of neutralizing poliomyelitis virus. The possible existence of a nonspecific maturation factor in poliomyelitis immunity has recently been discussed by Jungeblut and Engle [9] and the suggestion made that the immunity may be due to a hormonal balance characteristic of adult life.

An obvious way to determine the specificity and accuracy of immunity tests would be to apply them to a considerable number of persons whose previous experience with the corresponding infections is definitely known. In diseases as widespread as diphtheria, scarlet fever, tuberculosis and poliomyelitis, it is impossible at present to rule out previous contact with the causative organism in any inhabited region. In yellow fever, on the other hand, there are large populations known beyond reasonable doubt not to have been exposed to yellow fever or its virus. The insect vector is absent in large areas of the world, and in other regions, in which the vector is found, the disease has not been present within historical time.

Under these favorable conditions we undertook to investigate the specificity and accuracy of the immunity test now being widely used in epidemiologic studies of yellow fever: the intraperitoneal protection test in mice, as described by Sawyer and Lloyd.[10] In this test 0.03 cc. of sterile 2 per cent starch solution is injected intracerebrally into each of six anesthetized mice to localize the virus in the brain. Immediately thereafter the mouse is given an intraperitoneal injection of a mixture of 0.2 cc. of a 10 per cent suspension of virus-containing mouse brain and 0.4 cc. of the serum to be tested. Control groups of mice are given injections in the same way, except that known normal and immune serums are substituted for the serum to be tested. Mice dying from five to ten days after inoculation are considered to have died of yellow fever encephalitis if the results with the control groups are satisfactory. At least five out of six mice must survive if the result is to be considered "protection," and likewise five out of six must succumb if the result is "no protection." Results falling outside these narrow limits are regarded as "inconclusive."

## TESTS OF SERUMS FROM CHINA

The part of the world most definitely known to be free from yellow fever is the Orient. Through the courtesy of Dr. J. B. Grant, Dr. H. L. Amoss and Dr. I. C. Fang, of the Peiping Union Medical College, we obtained serums from eighty-eight Chinese residing in Peiping who had never been outside of China. In

From the Yellow Fever Laboratory of the International Health Division, Rockefeller Foundation.

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2. Heinbecker, P., and Irvine-Jones, E. I. M.: J. Immunol. **15**: 395 (Sept.) 1928.
3. Bay-Schmith, E.: Klin. Wchnschr. **8**: 974 (May 21) 1929.
4. Wells, J. R., and Heinbecker, P.: Proc. Soc. Exper. Biol. & Med. **28**: 887 (June) 1931.
5. Doull, J. A.; Ferreira, M. J., and Parreiras, D.: J. Prev. Med. **1**: 503 and 513 (Nov.) 1927.
6. Parr, L. W.; Goodale, R. H., and Krischner, H.: J. Prev. Med. **4**: 39 (Jan.) 1930.
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8. Soule, M. H., and McKinley, E. B.: Proc. Soc. Exper. Biol. & Med. **29**: 168 (Nov.) 1931.
9. Jungeblut, C. W., and Engle, E. T.: Proc. Soc. Exper. Biol. & Med. **29**: 879 (April) 1932.
10. Sawyer, W. A., and Lloyd, W.: J. Exper. Med. **54**: 533 (Oct.) 1931.

tables 1 and 2 is given the classification of the donors of these serums by age, sex and race. These known "normal" serums from China were examined by the protection test in mice. Whenever the quantity of serum would permit, the test was repeated on another day. In no case was the result "protection." The results are shown in table 3.

TABLE 1.—*Distribution of Donors of Serums by Age Groups*

| Age Group | Number of Persons in Each Series Tested | | | | |
|---|---|---|---|---|---|
| | Chinese Group | Canadian Group A | Canadian Group B | American Negro Group | Panamanian Group |
| 5 - 9 | .. | .. | .. | .. | 6 |
| 10 - 14 | .. | .. | .. | .. | 8 |
| 15 - 19 | .. | 2 | .. | 3 | 17 |
| 20 - 24 | 3 | 20 | 20 | 6 | 13 |
| 25 - 29 | 11 | 9 | 13 | 4 | 11 |
| 30 - 34 | 12 | 1 | 12 | 1 | 12 |
| 35 - 39 | 15 | 1 | 5 | 2 | 10 |
| 40 - 44 | 37 | 1 | 2 | 2 | 5 |
| 45 - 49 | 6 | 4 | 2 | .. | 1 |
| 50 - 54 | 3 | 6 | 1 | 2 | 3 |
| 55 - 59 | .. | 2 | 1 | .. | 4 |
| 60 - 64 | .. | 4 | .. | .. | 3 |
| 65 - 69 | .. | .. | 1 | .. | .. |
| 70 - 74 | .. | .. | 1 | .. | 1 |
| 75 - 79 | .. | 1 | .. | .. | .. |
| 80 - 84 | .. | .. | .. | .. | 1 |
| 85 - 89 | .. | .. | .. | .. | 1 |
| Unknown | 1 | .. | .. | .. | .. |
| All ages | 88 | 51 | 58 | 20 | 96 |

In the application of this standardized yellow fever protection test to serums of Chinese who could never have been exposed to yellow fever, there were no false positive results and few inconclusive ones. No evidence of physiologic factors capable of giving yellow fever immunity reactions was obtained by this method, not even in fully matured persons. The ages of the donors ranged from 21 to 53, and it will be noticed in table 1 that forty-six, or more than half, of the persons supplying serum were over 40 years of age. There was no opportunity to test a group of persons of the same race after known attacks of yellow fever.

### SERUMS FROM CANADA

Another region from which yellow fever is definitely absent is Canada. Through the kindness of Dr. J. G. FitzGerald and Dr. D. T. Fraser, of the School of Hygiene, University of Toronto, we secured serums from 109 residents of Canada. The donors of serum were classified in two groups: (*A*) fifty-one who had never been outside of Canada and (*B*) fifty-eight who had been in noninfected parts of other countries—Europe or the western, north-central or northeastern parts of the United States. Except on the western coast, none of the donors who had been in the United States had been farther south than Baltimore. The distribution of the donors by age, sex and race is shown in tables 1 and 2. The results of the tests in mice for protective power against yellow fever are given in table 3. The tests were repeated only when the results were "inconclusive" or "protection." In each group there was one serum giving "protection," but when the test was repeated the result was "inconclusive." It happened that the first tests of both these specimens were in a series in which virus was used which had been kept frozen overnight to economize virus, contrary to the usual method. Subsequent experience has shown that such treatment causes appreciable injury to the virus, and tends to increase the number of mice surviving in the test and thus heighten the risk of false positive results indicating protection. It seemed important, however, to investigate more closely the five serums which gave "inconclusive" results in both tests or "protection" followed by an "inconclusive" result. Two of these five serums were shown by additional tests to belong rightfully with the group showing "no protection." The first was in group A and came from a woman aged 21. The number of mice surviving was only three out of six and two out of five, respectively, in the first two tests, and was none out of five in each of three successive tests made with a new specimen of serum. The second of these serums was in group B and was from a man, aged 48. Only two mice out of six survived in each of the first two tests and one out of six in a third test.

TABLE 2.—*Race and Sex of Donors of Serums*

| Serum Group | Total No. Donors | Sex | | Race or Color | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Male | Female | White | Chinese | Negro | Indian | Mestizo |
| Chinese..... | 88 | 78 | 9* | .. | 88 | .. | .. | .. |
| Canadian A.... | 51 | 33 | 18 | 51 | .. | .. | .. | .. |
| Canadian B.... | 58 | 31 | 27 | 58 | .. | .. | .. | .. |
| American Negro | 20 | 15 | 5 | .. | .. | 20 | .. | .. |
| Panamanian... | 96 | 45 | 51 | 9 | .. | 52 | 14 | 21 |

* Sex not specified in one case.

TABLE 3.—*Results of Tests and Retests of Chinese and Canadian Serums*

| Serum Groups | First Test | | Second Test | | | |
|---|---|---|---|---|---|---|
| | Result | Number of Serums | Number Giving No Protection | Number Giving Inconclusive Result | Number Giving Protection | Test Not Repeated |
| Chinese | No protection | 79 | 66 | 6 | 0 | 7 |
| | Inconclusive | 9 | 5 | 3 | 0 | 1 |
| | Protection | 0 | 0 | 0 | 0 | 0 |
| | Total | 88 | 71 | 9 | 0 | 8 |
| Canadian A | No protection | 37 | .. | .. | .. | 37 |
| | Inconclusive | 13 | 10 | 1 | 0 | 2 |
| | Protection | 1 | 0 | 1 | 0 | 0 |
| | Total | 51 | 10 | 2 | 0 | 39 |
| Canadian B | No protection | 45 | .. | .. | .. | 45 |
| | Inconclusive | 12 | 10 | 2 | 0 | 0 |
| | Protection | 1 | 0 | 1 | 0 | 0 |
| | Total | 58 | 10 | 3 | 0 | 45 |

This leaves three serums in which a slight protective power was suspected. The particulars regarding the donors and the results of the successive protection tests are as follows:

1. Group A. Woman. Age 28. Mouse survival ratio: first specimen, 4/5, 2/6; second specimen, 3/5, 3/6, 2/6.

2. Group B. Woman. Age 22. Mouse survival ratio: first specimen, 3/6, 3/5, 4/6; second specimen, 1/6, 5/6, 5/6, 4/6.

3. Group B. Woman. Age 39. Mouse survival ratio: first specimen, 4/5, 2/6; second specimen, 0/6, 2/5, 1/6, 0/6.

The number of successive inconclusive results obtained with serum 1 suggests that it may have had slightly more protective power than the average normal serum, but that the one "positive" result was not representative and was due to the use of virus attenuated by freezing and storage overnight. In serum 3 the one positive result was also obviously a mistake due to the same deviation from the usual technic. Serum 2, on the other hand, is of special interest. Except for the high mortality in the mice used in the first test with the second specimen, which cannot be explained, the survival ratio ranged from 3/6 to 5/6 and showed definite

protective power just under the amount capable of giving "protection" with regularity.

We have, therefore, 1 serum, among 109 Canadian serums, which seems to give the results "inconclusive" and "protection," because of some property in the serum itself.

### SERUMS FROM PERSONS KNOWN TO HAVE BEEN INFECTED

With few exceptions the Canadian serums came from persons of British stock. The serum of a small number of persons of the same general stock, who had previously experienced known infections with yellow fever virus, had been tested in mice by Sawyer, Kitchen and Lloyd,[11] and their results are summarized in table 4. In the last column of the table is given the range of the titers of the serums when tested in serial dilutions by the intraperitoneal protection test in mice. It will be noticed that serums of all these twenty-one persons known to have been infected with virus from three weeks to thirty years before their serum was obtained gave definite "protection" even when diluted. The one serum with a low titer (1/4) was from a person infected thirty years before in Cuba in an experiment of the Army Yellow Fever Commission under Walter Reed.

TABLE 4.—*Results of Tests of Serums from Persons Recovered from Yellow Fever or Immunized by Vaccination*

| Method of Immunization | Time Interval Since Immunization | Result of Tests: No Protection | Result of Tests: Inconclusive | Result of Tests: Protection | Range of Titers |
|---|---|---|---|---|---|
| Known attack of yellow fever | 26 to 30 years | 0 | 0 | 3 | 1/4 to 1/512 |
| Accidental laboratory infections | 13 to 31 months | 0 | 0 | 6 | 1/128 to 1/512 |
| Vaccination with yellow fever virus and immune serum | 3 to 30 weeks | 0 | 0 | 12 | 1/64 to 1/512 |
| Total | | 0 | 0 | 21 | |

These results give evidence consistent with that obtained in numerous experiments in monkeys and illustrate the certainty with which protective power can be demonstrated in the serums of persons known to have been infected in recent years. The low titer obtained long after vaccination in one case suggests that the antibody content of the serum of a person who has recovered from yellow fever may fall with the lapse of time in some cases and perhaps reach a point at which the protective power of the serum is not demonstrable.

### TESTS OF THE SERUMS OF AMERICAN NEGROES

As the protection test in mice is being used in extensive epidemiologic surveys in Africa, it was of interest to test a group of Negroes who had probably not been exposed to yellow fever virus. It is well known that full-blooded Negroes in Africa and elsewhere, although apparently susceptible to infection, are more resistant to the effects of the disease than are persons of European stock. Through the kindness of Dr. J. H. Janney, Health Officer of Anne Arundel County, Maryland, we received 20 serums from Negroes residing in or near Annapolis. That their ancestry was principally Negro was concluded from their skin color. All were born in America, but four had been farther south than Maryland or had visited in foreign countries.

The results of the protection tests were "no protection" in nineteen instances and "inconclusive" in one. None of the tests have as yet been repeated. There was no evidence of any protective power in these twenty serums.

### SERUMS FROM PANAMA

Col. J. F. Siler, Chief Health Officer of the Canal Zone, and Dr. L. B. Bates, Chief of the Board of Health Laboratory at Ancon, were kind enough to send us ninety-six serums collected in the Republic of Panama and the Canal Zone. The group of donors was considered a representative sample of the permanent population. They had all been born on the Isthmus of Panama and had always lived there. They were persons not known to have experienced yellow fever. The donors are classified by age, sex and race in tables 1 and 2, and the results of the protection tests, classified by the ages of the donors, are given in table 5. Serums giving inconclusive results in the first test were retested once, and the second result was accepted if decisive. Without knowledge of the history of yellow fever in the Isthmus of Panama, a region from which the disease is now absent, this table might have been taken as evidence in favor of a maturation factor in yellow fever immunity, inasmuch as demonstrable immunity was found to be absent from the younger persons and present in many of the older ones. It happens, however, that the last known case of yellow fever on the Isthmus was in the year 1905, twenty-seven years ago, and all of the fourteen persons whose serums showed protective power were old enough to have been exposed prior to that date. None of the fifty-five serums from persons under 30 years of age gave protection.

### THE SIGNIFICANCE OF INCONCLUSIVE RESULTS

In every large series of tests a certain minimum number of "inconclusive" results (those in which more than one and fewer than five mice out of six survive), arranged according to chance distribution, is to be expected and is of no significance. The mortality rate of mice in a series of our tests of known nonprotective serums was computed for us by Dr. H. Muench and found to be 0.879, or 87.9 per cent. With this mortality rate, the theoretical distribution of mouse survival ratios in 100 such tests would be as follows: 0/6 in 46 instances, 1/6 in 38 instances, 2/6 in 13 instances, 3/6 in 3 instances and 4/6, 5/6 or 6/6 in no instances. The number of serums giving "no pro-

TABLE 5.—*Results of Tests of Serums from Panama by Age Groups of Donors*

| Age Group of Donors | Number of Serums Giving Following Results: Protection | Inconclusive | No Protection |
|---|---|---|---|
| 5–9 | .. | .. | 6 |
| 10–14 | .. | .. | 8 |
| 15–19 | .. | 1 | 16 |
| 20–24 | .. | 2 | 11 |
| 25–29 | .. | .. | 11 |
| 30–34 | 2 | 1 | 9 |
| 35–39 | 5 | 1 | 4 |
| 40–44 | 1 | .. | 4 |
| 45–49 | .. | .. | 1 |
| 50–54 | 1 | .. | 2 |
| 55–59 | 2 | .. | 2 |
| 60–64 | 1 | .. | 2 |
| 65–69 | .. | .. | .. |
| 70–74 | .. | .. | 1 |
| 75–79 | .. | .. | .. |
| 80–84 | 1 | .. | .. |
| 85–89 | 1 | .. | .. |
| Totals | 14 | 5 | 77 |

11. Sawyer, W. A.; Kitchen, S. F., and Lloyd, W.: J. Exper. Med. 55: 945 (June) 1932.

tection" would be 84 per cent of the total, and those giving "inconclusive" results would be 16 per cent. None would give "protection."

### CAUSES OF ERROR

If the strain of mice used in the protection test should be unsuitable because of low susceptibility to yellow fever virus, or if the virus in the suspension injected should be weak or insufficient in amount, there would be danger of getting false "protection," but ordinarily the controls would protect against these errors. If deaths should be occurring among the mice from other causes than yellow fever encephalitis, the tendency would be to get "no protection" with serums which are really protective. Unhealthy mice should not be used.

Properties of the serum may also be responsible for mistakes in concluding that the donor had previously been either nonexposed or infected. The serum may have deteriorated since the blood was drawn, or it may possess a degree of protective power not due to experience with the specific virus. Such protective power was not detected in our series of tests of known normal serums, except in one case in the Canadian series. In that case it was not high enough to give "protection" with regularity. Doubtless more "false positives" revealing this weak physiologic protective power of serum would be obtained if the test were made unduly sensitive by increasing the amount of serum used or by diminishing the amount of virus. Careful quantitative adjustments are necessary in every immunity test. The evidence here presented seems to show, however, that in the sensitive test under study the nonspecific physiologic protective power of serums from persons never infected with yellow fever virus is not strong enough to give false "protection," except in rare instances. The possibility of getting "no protection" exceptionally with the serum of persons who actually had yellow fever many years ago must also be taken into consideration.

Although mistakes due to the presence of physiologic protective substances, or to the loss of specific antibodies with the passage of time, probably do occur in rare individual instances and additional mistakes are made through errors of technic or the use of unsuitable animals, we are convinced that, when made with reasonable care, the test is remarkably specific and reliable, and that a positive test is strong evidence that the donor of the serum has previously been infected with yellow fever virus.

### SUMMARY

The yellow fever protection test in mice, as an example of the immunity tests used in epidemiologic studies, was investigated for specificity and reliability. Serums of persons in Canada and China who could never have been exposed to yellow fever virus were tested for protective power against this virus. In only one instance was there any demonstrable nonspecific protective power and it was insufficient in amount to give protection with regularity. The test was found to be highly specific and useful as an indicator of past infection.

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## ABSTRACT OF DISCUSSION

DR. BOLIVAR J. LLOYD, Washington, D. C.: Epidemiologists will now be able to go into those places where yellow fever may have been present but unrecognized and be able to say definitely whether or not yellow fever has been present and just about how long. Conversely, they will be able to prevent false alarms. I should like to see Drs. Hughes and Sawyer go further with their experiments, as no doubt they will. I should like to know whether or not they can immunize on a large scale by giving their attenuated virus to human beings without the protection of immune serum.

DR. C. W. JUNGEBLUT, New York: The results of Drs. Hughes and Sawyer go far toward justifying the conclusion that endemic resistance to yellow fever, as determined by the neutralizing power of the serum, is essentially due to an acquired specific immunity. However, in my opinion it would be hazardous, on the basis of this one unusually illuminating example, to rely indiscriminately on serologic tests in epidemiologic studies. The normal human serum contains a large variety of substances capable of reacting with just as large a variety of antigens. Since Buchner's discovery of alexin, immunologists have tried in vain to explain the origin of these mysterious so-called normal antibodies and their relationship to typical immune bodies. This constitutes one of the most pressing problems in modern immunology. Certainly some of these antibody-like agencies, such as trypanocidal or anthracocidal substances, for instance, cannot possibly have been formed as the result of previous exposure to the specific antigen. In acute anterior poliomyelitis the question as to the nature and origin of the virucidal substances encountered in normal adult serums is unsettled. With such a limited incidence of the disease and such a restricted morbidity, knowledge of the actual dissemination of the infectious agent remains speculative. Utilization of the serologic test in an inverse manner as a means of judging previous contact with and by implication the immunizing effect of the virus is neither justified by clinical experience nor supported by experimental facts. Moreover, the statistical information yielded by such tests is not at all consistent. In my own work I have failed to recognize any convincing relation between density of population and absence or presence of the virucidal property. Through Dr. Sawyer's courtesy I have been able to examine some of the same Chinese serums just reported as lacking virucidal power against yellow fever virus, for their capacity to inactivate the virus of poliomyelitis. I have also had the opportunity of testing a small number of serums collected from isolated Eskimo tribes in Greenland. All of these serums have neutralized the poliomyelitis virus. Those who assert the specific nature of the immune bodies against poliomyelitis virus will find it difficult to reconcile these observations with the complete or practically complete absence of epidemic poliomyelitis in either China or Greenland.

DR. C. A. MOHR, Mobile, Ala.: I should like to ask the authors to state briefly under what conditions the blood of persons who are supposed to have had yellow fever can be used for experimental purposes. How it is transported?

DR. W. A. SAWYER, New York: Dr. Jungeblut has spoken of the danger of applying the results obtained in yellow fever immunity tests to other diseases and drawing the conclusion that in none of these other diseases, poliomyelitis in particular, does one get definite evidence of immunity, by accepted tests, in persons who have not previously been immunized by infection. His position is logically sound, but, unless populations can be found which can be shown to have been free from these other diseases since the birth of the present inhabitants, it will be unjustified to assume that the adults giving reactions indicating immunity have not been previously exposed to the corresponding specific infectious agent. Every immunity test used in epidemiologic studies should be quantitatively adjusted so that it does not give positive tests in persons who have not been exposed. If immunity tests are made unduly sensitive, the number of "false" positive and inconclusive results becomes considerable and difficult to interpret. We hope that Dr. Jungeblut will be able to find the explanation of some of the differences between unexposed individuals in the extent to which they possess the "normal antibodies" responsible for such reactions. As far as I am aware, it has not been clearly shown that complete or partial reactions of immunity in unexposed animals or persons have any demonstrable relation to susceptibility to the corresponding disease. In our experience with rhesus monkeys we find that the serums of certain normal animals give partial protection against yellow fever virus, but nevertheless on subsequent inoculation most of these monkeys are found to be definitely susceptible. In closing, I shall answer the question of

Dr. Mohr. Serum from a person who has recovered from yellow fever at any time in the past will usually have demonstrable protective power against yellow fever virus. If sterile, such serum will retain its antibodies at ordinary temperatures long enough to be sent by mail to our laboratory from anywhere in the United States. Any one wishing to cooperate in our investigation by sending serum should send enough for the tests —not less than 10 cc.

## PRINCIPLES OF TREATMENT IN THE COMMON ARTERIAL DISEASES OF THE EXTREMITIES

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Clinical interest in a given field is usually proportional to its therapeutic possibilities. Consequently, it is not surprising that until recently the common arterial diseases of the extremities have attracted comparatively little attention. Thus one of the leading systems of medicine, in its 600 page volume dealing with diseases of the heart, blood vessels and blood, devotes just four pages to chronic arterial diseases. And thrombo-angiitis obliterans is not even mentioned! With but few exceptions, internists and surgeons have neglected this problem of the common peripheral arterial diseases. Dr. Finney's comment at a surgical clinic that any one can amputate a leg, but that it takes a good physician to save one, has long been true. Yet in the past, investigations of peripheral arterial disease have been chiefly concerned with the end-stages. Attention has been focused on the extremity showing actual or threatened gangrene. Before this time arrives, a certain fatalism has characterized the attitude of the medical profession toward these conditions. It is true that since Buerger directed attention to presenile arterial thrombosis on an inflammatory basis as distinguished from senile or diabetic arteriosclerosis, this clinical differentiation has been made fairly successfully. It is also true that many different remedies have been proposed for the treatment of thrombo-angiitis obliterans. However, specific treatment of the peripheral arterial diseases based on an anatomicopathologic classification has been disappointing. There is no treatment for thrombo-angiitis obliterans as such. The outcome of the disease and the effect of the various forms of therapy depend on a physiologic function, namely, the state of the local circulation, and not on the anatomic condition of the main arteries. The predominant importance of function rather than structural change in the peripheral vascular diseases has received recognition in their study only in the last few years.

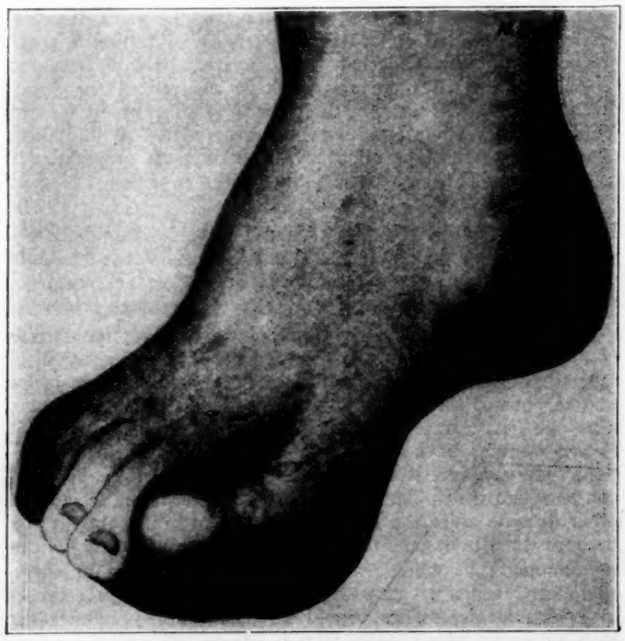

Fig. 1.—Thrombo-angiitis obliterans. Physical signs present obvious evidence of circulatory impairment (ischemic areas with adjacent rubor). They do not demonstrate whether the deficient arterial supply is physiologically dependent on vasoconstrictor spasm or on mechanical occlusion.

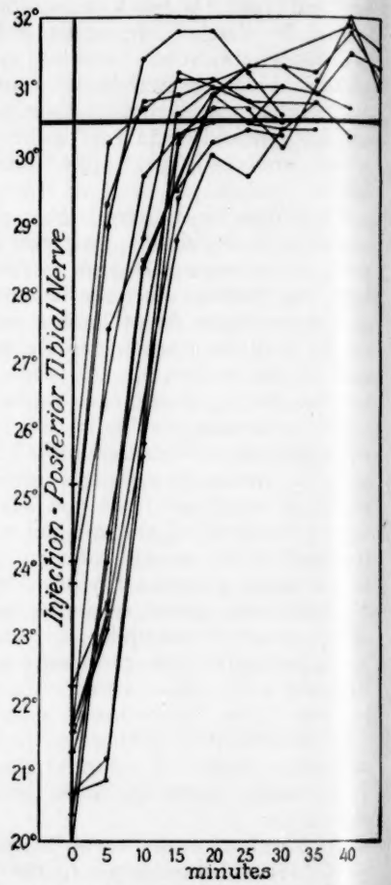


Fig. 2.—Response of the normal peripheral circulation to nerve block. The temperatures in the distal, anesthetized part of the extremities come up to approximately the same level under standard conditions. (All measurements of surface temperature were made with the Tycos dermatherm.)

Brown-Séquard, and, soon thereafter, Raynaud, pointed out that persistent arterial spasm could result in serious circulatory impairment in the extremity, even leading to gangrene. The rôle of such vascular spasm in producing the ischemic paroxysms of Raynaud's disease is common knowledge. However, only in the last few years has it been shown that spasm is an important element in many instances of the common arterial diseases in the extremities. Since the recognition of this significant fact and the development of satisfactory methods for determining the vasoconstriction in the clinical syndromes, much progress has been made in treatment. The attitude of hopelessness in regard to peripheral arterial disorders should be abandoned. In place of the previous fatalism there are emerging certain definite principles of treatment in these conditions.

Whatever the type of the common arterial disease, when symptoms are produced they are dependent on an impairment in the local circulation. Such a circulatory deficiency is recognized by its symptoms and the signs elicited through ordinary methods of physical examination. The most important of such symptoms and signs are claudication, pain or other sensory

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changes, dependent rubor, work and postural ischemia, the angle of circulatory efficiency, the absence of arterial pulsation, trophic changes, etc. Thus the clinical examination determines whether or not there is a local circulatory deficiency (fig. 1). When this deficiency is present it is dependent on one or both of two factors affecting the arteries, viz., first, mechanical obstruction, and second, vascular spasm. The differentiation of these two elements as the cause of the circulatory deficiency requires a special test.

### TEST FOR SPASM AND OCCLUSION

The simplest and most direct method of determining whether vasoconstriction is present is by observing the effect of temporarily paralyzing the sympathetic vasomotor fibers. This is most conveniently performed by using local anesthesia to interrupt the vasoconstrictor pathway at some point between the central nervous system and the terminal vessels.[1] When this is done in the normal person, there is a marked increase in the local circulation as soon as the vasoconstrictor nerve fibers are paralyzed. It has been found that under standard conditions the circulation in the distal part of the extremity reaches approximately the same level in all normal persons (fig. 2). In occlusive arterial disease without spasm there is no increase in the deficient flow of blood under such conditions (fig. 3). But if vasoconstrictor spasm plays an important rôle in the production of the circulatory impairment, the blood flow is also improved in the anesthetic field. An important point under such circumstances is whether or not the local circulation rate reaches the normal level. If it does, the circulatory impairment is entirely dependent on spasm. If it does not, the amount by which it fails to reach the normal level, as measured by the surface temperature, represents the contribution of mechanical occlusion (fig. 4). This simple test determines whether vasoconstrictor spasm or mechanical occlusion is responsible for the circulatory deficiency in the extremity, or, if both are present, the relative significance of each. In every case of peripheral arterial disease, irrespective of

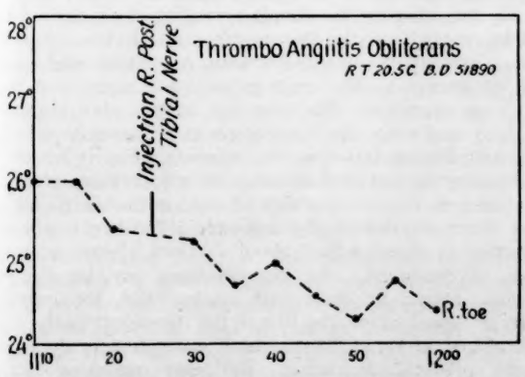


Fig. 3.—Thrombo-angiitis obliterans. The circulatory deficiency in this case is due solely to mechanical occlusion. There is no increase in the flow of blood after nerve block.

the clinical diagnosis, it is essential to determine the relative proportions of these elements before a rational basis for treatment can be established. In different stages of the same disease, the proportions may change greatly. Thus it is our experience that most cases of thrombo-angiitis obliterans early in the disease usually show a considerable element of spasm, and that this is often the determining factor in the ischemia at this time. Later, however, the thrombotic process may become so extensive that we find an insignificant amount, or absence of spasm (fig. 5). Yet the diagnosis of the disease has not changed. All arterial disorders in the extremities require not only a diagnosis of the anatomic

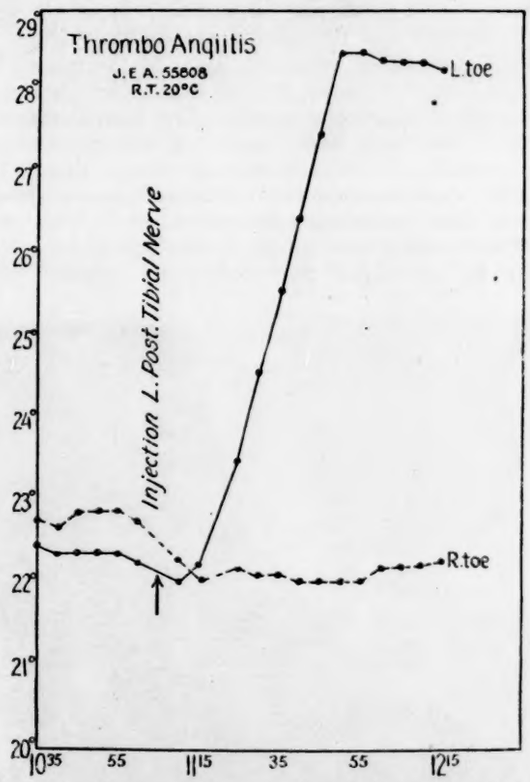


Fig. 4.—Thrombo-angiitis obliterans. Vasoconstriction is chiefly responsible in this case for impairment in the local blood supply. After anesthetizing the nerve the increased temperature of the surface demonstrates the improved local circulation.

condition but also an evaluation of the physiologic state of the local circulation.

### TREATMENT

Treatment should always be directed first toward preventing the ischemia from doing more harm than necessary. This is a general principle and applies to all cases irrespective of their cause. Under this heading come such simple but important measures as rest, postural treatment and exercise, relief from pain and, particularly, scrupulous prophylaxis against infection.[2] The choice of other measures, however, depends on the presence or absence of spasm. When occlusion is shown by a functional test to be the causative factor, then at present there is no way to augment greatly the diminished flow of blood to the extremity. In such cases, the principle of treatment is to aid the more peripheral distribution of the small amount of arterial blood available. We have found venous ligation to be the most valuable procedure for this purpose.[3] This is no panacea in the treatment in this group of cases, but it appears to be of benefit in cases in which the circulation is not hopelessly

1. The basis for and the technic of this test have been recorded in our previous publications. Scott, W. J. Merle, and Morton, John J.: Sympathetic Activity in Certain Diseases, Especially Those of the Peripheral Circulation, Arch. Int. Med. **48**: 1065 (Dec.) 1931; The Differentiation of Peripheral Arterial Spasm and Occlusion in Ambulatory Patients, J. A. M. A. **97**: 1212 (Oct. 24) 1931.

2. The importance of these general measures and their application is well outlined by Dr. A. W. Allen (Ann. Surg. **92**: 931 [Nov.] 1930).

3. The results of this treatment as used in our clinic have recently been reported. Pearse, H. E.: The Use of Vein Ligation in the Treatment of Arteriosclerotic and Diabetic Gangrene, J. A. M. A. **98**: 866 (March 12) 1932.

inadequate. On the whole, however, the prognosis in this group is much poorer than when there is a large element of spasm.

In the latter group, the most important principle of any treatment adopted is to overcome, either temporarily or permanently, the arterial spasm. Various methods to accomplish this purpose have been used. Among them are, particularly, sympathetic denervation, either at the level of the chain or in the peripheral nerves, fever-producing injections, local or general hyperthermia and the use of vasodilating drugs. The more conservative measures, such as the use of drugs and of local heat, have proved unsatisfactory for effective control of arterial spasm. The immoderate use of tobacco has long been suspected clinically of being detrimental. Coller has recently shown that it causes definite vasoconstriction. Certainly tobacco should be denied these patients, at least in excess. This prohibition, even when carried out by the patient, is not sufficient to overcome the vasospasm already present.

Fig. 5.—Thrombo-angiitis obliterans. The left leg was amputated eleven years previously. There is marked dependent rubor in the right foot and a patch of dry gangrene on the great toe. (Figure 3 shows the response of this patient to nerve block.) This is the late stage of thrombo-angiitis obliterans, when the extension of the thrombotic process completely overcomes or obscures the spastic element.

Vasomotor denervation of the lower extremity by lumbar sympathetic ganglionectomy produces a continuous improvement in the local circulation to the same degree as was caused temporarily by the test with local anesthesia.[4] This operation is the procedure of choice in the young or middle-aged adult when the clinical evidence of a local circulatory deficiency and the functional importance of vasoconstrictor spasm are clearly established. The one important objection to this form of treatment is that it requires a major operation. The peripheral vasodilatation accompanying the systemic reaction to the injection of protein or inorganic chemicals has been advocated as a method of treatment in the milder cases in place of surgical intervention. The effect lasts from a few hours to several days. This method would be useful as a substitute for operation in the older group of patients concerning the condition of whose myocardium there may be some doubt. It is exactly in these patients, however, that the dangers of such reactions become greater. Consequently, it does not help in the more difficult decision as to the method of choice for overcoming spasm. For these patients, paravertebral injections of alcohol have been advocated. This procedure probably does not give permanent relief; it is usually followed by rather severe neuritic pains, and would make a later operation, if necessary, much more difficult. Periarterial sympathectomy does not have sufficient merit to warrant its use in such cases. Injection of alcohol into the peripheral nerves below the main muscular branches [5] not only relieves pain, but may result in improvement in the local circulation when the latter is impaired by vasoconstrictor spasm. The two objections to this method of accomplishing the latter purpose are: First, anesthesia in the peripheral area accompanies the vasomotor paralysis. Second, vasoconstrictor innervation to the vessels is reestablished in a few months. This method, however, is helpful in some difficult cases when operation and fever-producing injections are absolutely contraindicated by the patient's condition. The one procedure that permanently overcomes the detrimental effects of sympathetic vasoconstriction in arterial disease is sympathetic ganglionectomy. We hope some day to have a simpler method of removing as satisfactorily arterial spasm in the extremities.

4. Our results in substantiation of this point have been presented before the American Surgical Association (The Quantitative Determination of Vasoconstrictor Spasm as a Basis of Therapy in Peripheral Arterial Disease, Ann. Surg., 1932, to be published).

## ABSTRACT OF DISCUSSION

DR. RUDOLPH MATAS, New Orleans: The medical profession is indebted to Drs. Scott and Morton for their constant efforts to determine the rôle of vasomotor spasm as a cause of arterial obstruction and particularly for devising a simple and practical method of differentiating between spastic and arterial obstruction in the lower extremities. Their method determines not only the existence of spasm but also the extent or degree to which this contributes to the arterial obstructions. Until lately it has been necessary to depend on general or spinal anesthesia and the injection of typhoid vaccines and other fever producing substances to obtain the information that is now readily furnished by the simple posttibial block devised by Scott and Morton. From the therapeutic point of view, stress has been laid on sympathetic ganglionectomy, radicotomy and periarterial sympathectomy as the most certain and permanent means of obtaining vasomotor dilatation and in this way improving the capillary and arteriolar circulation in all cases in which spasm is a contributing factor in the ischemia. But it is not possible to disguise the fact that a lumbar ganglionectomy or radicotomy is a serious operation which is not applicable to all patients even when physiologically indicated. Neither is the repeated induction of fever with typhoid vaccines always a satisfactory mode of treatment. As long as these peripheral circulatory diseases cannot be dealt with etiologically, the only hope of relief and prolonging the life of the dependent parts lies in the control and arrest of the vascular spasm and in the stimulation of the collateral circulation. But before resorting to the traumatizing radicotomies and ganglionectomies, one should exhaust all the simple and safer methods of physical therapy (postural exercises, heat, contrast baths, vascular gymnastics, alcoholization of nerves, irradiations, the so-called synthetic fever). In line with these suggestions, I would direct attention to the irradiation of the lumbar region with x-rays as a vasodilator procedure. These irradiations, recently advocated by Langeron and Desplats, Morin, Brunet, Zimmerman and others in France, are directed to the suprarenals and probably act on the lumbar ganglions as well. The authors quoted report relief in intermittent claudication, Buerger's disease and threatened arteriosclerotic gangrene. Further trial of angiodilating drugs, such

5. This procedure has been presented in a useful, systematized form by Smithwick and White (Surg., Gynec. & Obst. **51**: 394 [Aug.] 1930).

as acetylcholine and the muscle extracts introduced by J. S. Schwartzman of Odessa and M. S. Schwartzman of London (1931), is to be encouraged. Such vasodilating agents are helpful in relieving pain, retarding gangrene and, when this is established, permitting more conservative amputations. Little benefit is to be expected from the preventive ligation of the popliteal vein in chronic obstructive circulatory disorders of the legs. The effect of popliteal ligations are certainly too transitory in arteriosclerotic disease; and when the veins are obstructed, as in thrombo-angiitis, this procedure is positively harmful. The ligation of the satellite vein coincidentally with arterial ligations is subject to special and well defined indication and there is no justification for the present tendency to the indiscriminate ligation of the satellite vein as a routine procedure. There is much that I could say in regard to other questions brought up by the paper of Drs. Scott and Morton, but I have only time to congratulate the authors and their American co-workers on lifting this important division of surgery from an empirical to a highly scientific plane.

DR. EDGAR V. ALLEN, Rochester, Minn.: Massive gangrene of an extremity as a result of arterial disease is a stage which is comparable to the metastasis of cancer and represents a calamity which is largely avoidable. Not only is it essential that these diseases be studied extensively in medical centers but the average practicing physician must have the benefit of such studies. The feeling of hopelessness should be abandoned. The paper of Drs. Scott and Morton represents, therefore, a valuable contribution. I feel that great care should be taken regarding nomenclature. The authors speak of vasoconstriction and I should like to ask whether spasm is really present or is it rather absence of maximal vasodilatation. Nature is said to be provident, but her failure is evident in arterial diseases of an occlusive nature; tissue dies from an inadequate blood supply; often an increased blood supply is available but not utilized. Some investigators view the state of the arterioles in occlusive arterial disease not as hypertonic, that is, spastic, but rather as isotonic in the sense that the arterioles in the normal extremity are not spastic but exhibit a tone that is indicated as normal. If the condition is really one of spasm, the term is correct; if not, a word that indicates lack of maximal dilatation should be coined. Simpler methods for influencing the sympathetic nervous system are needed. There is great need for an effective agent which will influence the fibers of the sympathetic nervous system in the region where vasodilatation is needed. What is needed is a drug such as has been suggested by Brown, which will paralyze the peripheral sympathetic nervous system, either temporarily so that such a drug may be used in much the same manner as insulin in diabetes, or semipermanently; that is, through the production of a neuritis of the peripheral sympathetic nervous system. My experience with roentgen irradiation over the lumbar or cervical sympathetic trunks has not been satisfactory. I am now trying direct irradiation of the hands and feet. If vasodilatation can be produced by irradiation of the sympathetic nervous system, why should it be given at an area far removed from that in which the major trouble lies? This is a fruitful period in the treatment of vascular diseases; advances are not linked solely with the name of any man but with groups of physicians.

DR. A. W. ALLEN, Boston: The management of peripheral vascular disorders in general has been neglected in times past, but a few enthusiastic individuals have attempted to treat these diseases, advocating one form of therapy or another; particularly is that true with regard to thrombo-angiitis obliterans. All these individuals have had some success. The various methods have something in their favor, but the keynote of their success is due to the fact that these patients are treated along general lines of hygienic measures, proper position of the extremity, more or less at the level of the heart, where the interchange of blood is at its best. These efforts have been successful, owing to the painstaking care of the patient. Thrombo-angiitis obliterans has a tendency to be a self-limiting disease; in a certain number of cases it does not progress, apparently, beyond a certain point, or the development of adequate collateral circulation keep pace with the disease. In the cases that show a high vasomotor gradient, the operations on the sympathetic nervous system as advocated by Adson certainly constitute the best form of therapy. Unfortunately, in cases of thrombo-angiitis obliterans there is a large group of patients who have a low vasomotor index and in whom this operation is perhaps of some use but does not relieve the pain of ulcerated lesions. Then one must resort to other methods. I have not had much success with vein ligation. I have, however, saved a number of extremities by alcoholic injection of the peripheral sensory nerves, and in this group of cases, hopeless to begin with, there have been a number of patients rehabilitated. The point which Dr. Edgar V. Allen has made about further studies along this line is, of course, important. The etiologic agent in thrombo-angiitis obliterans is not yet known, and, until it is, perhaps rational therapy in that direction cannot be instituted. The general measures that are best adapted for the comfort of these patients have been reported and should be studied by any one interested. Whatever else is done, whatever specific therapy is used, unless these general measures are used in conjunction, they are apt to result in failure.

DR. A. W. ADSON, Rochester, Minn.: In carrying out sympathectomy in cases of thrombo-angiitis obliterans, I have observed that if the patient complains of a lesion in one extremity, manifested by an ulcer, interference with the circulation in the opposite extremity is likely to be found, even though ulcers are not present, and that in performing a bilateral lumbar ganglionectomy, one has done something to check the progress in the opposite extremity. Yesterday I had occasion to report 100 consecutive cases of thrombo-angiitis obliterans in which operations had been performed in the Mayo Clinic. As is well known, our studies are made both by the medical and by the surgical groups, and with the exception of one case there has not been an advance of the disease to the opposite nonulcerated extremity. Dr. Barker, from the department of vascular diseases of the clinic, reviewed 240 cases of thrombo-angiitis obliterans; he learned that the incidence of amputation in the poorly treated cases was 25 per cent and that it was reduced to 14 per cent following active medical management. Reviewing the cases in which operation had been performed by Dr. Craig, Dr. Learmonth and myself, he found that it had been reduced to 5 per cent, showing that removal of the sympathetic chain or, rather, destroying the vasomotor fibers did play a tremendous part in improving the circulation and in the conservation of the extremities. Radiotherapy to the ganglions and to the vessels in the digits has proved to be of no value in the treatment of our cases.

DR. W. J. MERLE SCOTT, Rochester, N. Y.: We have tried acetylcholine, both in normal individuals and in individuals with proved vasoconstrictor spasm. I was unable to find that we did anything to those individuals, either temporarily or permanently. That is, we would get a little temporary rise in temperature occasionally, but nothing like the effect that is obtained from actually paralyzing the vasomotor fibers. In regard to ligation of the vein, certainly its results in the occlusive group are not at all of the same order as those following sympathectomy in the spastic groups. Pearce, who has reported the cases from our clinic followed for over a year, concluded that in a certain significant proportion of them the clinical results were improved by venous ligation; but that is a difficult thing to be certain of. There is no doubt that there is a temporary increase in the peripheral skin circulation. Dr. Edgar V. Allen brings up an important question, that of nomenclature. I think that most of the notions now current must be revamped, and certainly textbook classifications of vascular diseases. After we recognized Buerger's disease we found that it didn't necessarily occur in the Jew. Then we found that it occurred in other regions of the body and other organs. Then it was found that there could be calcification of the vessels in it, and so on. Now today I must confess that in at least 50 per cent of the patients who come to me with common presenile or early senile vascular lesions I cannot state positively whether they have thrombo-angiitis obliterans or whether they have some other form of vascular disease. But I can tell whether or not physiologically spasm is playing an important rôle in creating the circulatory deficiency. Dr. A. W. Allen has brough up what to me is the crucial point in the therapy of thrombo-angiitis obliterans; namely, the development of collateral circulation. I feel that the evidence available from our studies and those from other clinics strongly suggests that the most effective way of increasing to the maxi-

mum the collateral circulation in the spastic group is by sympathetic ganglionectomy. Dr. Morton and I have tried to bring out in this paper certain principles of treatment, and I think that those principles really are now beginning to emerge as something to guide us rather than the feeling of hopelessness, of not knowing what to do in the face of these difficult problems.

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## THE TRANQUILIZING POTENCY OF MORPHINE, PANTOPON, CODEINE, PAPAVERINE AND NARCOTINE

### RESULTS OF TESTS ON THE RAT

O. W. BARLOW, PH.D.
CLEVELAND

Sahli,[1] following the introduction of omnopon, expressed the opinion that the combination of the alkaloids of opium produced a stronger and more rapid action than morphine. Winternitz [2] administered large dosages of the residual alkaloids to man, and although he was able to produce narcosis without undesirable side actions concluded that morphine was quite superior if analgesia was required. Macht and his associates,[3] after an extensive study of the responses of man to graded electrical stimuli before and after the administration of a series of the opium alkaloids, reported that the order of analgesic power was morphine > papaverine > codeine > narcotine > and thebaine. Codeine was reported as quite inferior to either morphine or papaverine. Narcotine alone produced an initial hypersensitiveness which was followed by a slight analgesia. Nevertheless, combinations of narcotine and morphine (narcophine) were said to produce a better analgesia than did the morphine contained in the combination. Möhrke, in 1921, likewise reported that narcotine potentiated the analgesic action of morphine. Such claims in relation to narcotine have been confirmed and contradicted both clinically and experimentally. Proof of the greater analgesic properties of such preparations as pantopon or narcophine as compared with morphine rests on a very insecure basis, and it is quite suggestive, as stated by Sollmann in 1926, that the clinical dosages of narcophine, pantopon and morphine are almost exactly equivalent as to their morphine content.

An opportunity of investigating this problem objectively and quantitatively is offered by the persistent restlessness of rats when tied back down to an animal board. After a period of from fifteen to twenty minutes they become partially reconciled or convinced of their inability to escape, but the discomfort, anxiety and natural restiveness are reflected by periodic muscular movements in complete absence of noise or other exciting causes. Records obtained over a period of from two to three hours at wide intervals are quite constant, and no evidence of the training effects of this procedure was obtained. This animal, because of the constancy of its reactions, should serve as an excellent test object for the study of sedatives.

The marked tranquilizing action of morphine, as illustrated in figure 1, on the muscular movements or activity of rats under these conditions was used as a basis for comparing the sedative effects of a series of narcotic alkaloids under standard conditions which were comparable in certain respects to clinical conditions in which morphine is indicated. The restlessness ensuing from the enduring discomfort of the position and restraint is closely analogous to a wide range of distressful conditions against which morphine is used therapeutically, including pain, apprehension, dyspnea and cough.

#### METHODS

Normal adult albino rats were used in all experiments. The animals were tied in a supine position to small padded boards having the general contour of the body and fitted with a head guard consisting of a short length of brass tubing attached to an adjustable base. This guard extended over the head and neck, to the sternum, and although free movement of the head was possible, the animals were unable to injure themselves in attempts to free their legs from the thongs.

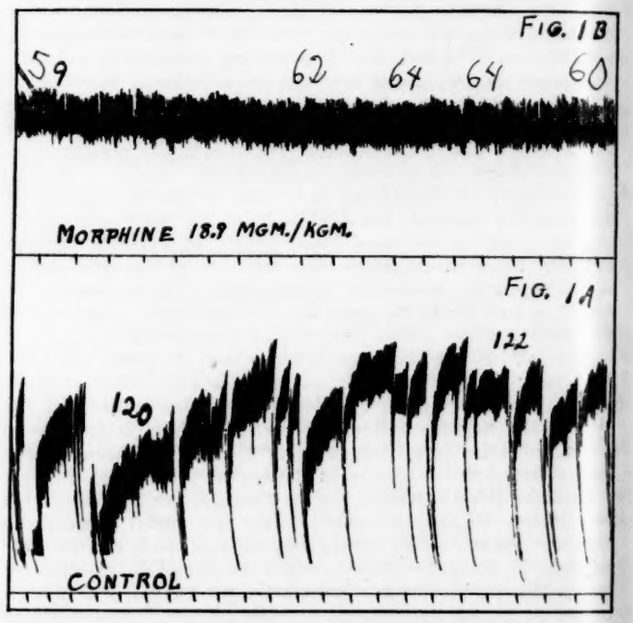


Fig. 1.—*A*, the respiratory (upstroke of lever indicates an inspiratory movement) and muscular movements of a normal rat when tied in a supine position. The time is in minutes. The respiratory rate per minute is indicated by the numerals above the tracing. *B*, the tranquilizing effect of morphine in a dosage of 18.9 mg. per kilogram (4.5 per cent of the minimum lethal dose) on the respiration and spontaneous movements of the same rat.

Graphic records of the respiratory and spontaneous muscular movements were obtained through the medium of a light lever connected with the skin just below the xiphoid process by means of a thread and a small bulldog clamp.

In a second series of experiments, the tranquilizing effectiveness of morphine and papaverine (as representative of the phenanthrene and isoquinoline groups of the opium derivatives) on the spontaneous movements was compared with that on the reinforced or painful reactions of the same animal when stimulated continuously by means of a subtetanic faradic current. Fine copper wire electrodes were wound around each hind foot and wet contacts maintained by covering the electrodes with cotton saturated with saline solution. Movements were recorded graphically from one (usually the left) of the hind feet by connecting the lever to one of the toes. Control records were obtained before and during stimulation. The stimuli were then discontinued

From the Department of Pharmacology of the Western Reserve University School of Medicine.
This study was aided in part by a grant from the Therapeutic Research Committee of the American Medical Association. The pantopon used was furnished by the Hoffmann-La Roche Company.

1. Sahli, H.: München. med. Wchnschr. **57**: 1326, 1910.
2. Winternitz, H.: München. med. Wchnschr. **59**: 853, 1912.
3. Macht, D. I.; Johnson, S. L., and Bollinger, H. J.: J. Pharmacol. & Exper. Therap. **8**: 451 (Aug.) 1916. Macht, D. I.; Herman, N. B., and Levy, C. S.: Ibid. **8**: 1, 1916.

and the drug was administered. Sixty minutes later the procedures carried out during the control period were repeated.

The alkaloidal salts tested were dissolved in distilled water and the concentration adjusted so that the volume administered (subcutaneously) was relatively constant. The agents were compared as to equivalence with the morphine base over a range of dosages varying from 0.5 to 15 per cent of the minimum lethal dosage of morphine. Rest periods of from nine to twelve days intervened between successive experiments on individual animals to obviate the development of tolerance.

A series of from seven to fifteen rats were tested with each dosage of each of the alkaloids and pantopon. The average number of movements per minute over a period of from five to ten minutes were counted before, and again from sixty to eighty minutes after, medication. The median of the data for each series was obtained and the results were expressed in figures as percentages of the control activity.

## RESULTS

*Morphine.*—The sedative effects of morphine were apparent with the minimal dosage tested (fig. 2 *A*). Movements were reduced 25 per cent with 2.1 mg. per kilogram of body weight. The degree of tranquilization increased with the dosage and was complete following the administration of from 19 to 21 mg. per kilogram. Such dosages are equivalent to from 4.5 to 5 per cent of the minimum lethal dosage (0.42 Gm. per kilogram) for the rat and in this respect correspond to a dosage of 15 mg., or one-fourth grain, for man.

*Codeine.*—The tranquilizing efficiency of codeine differs distinctly from that of morphine (fig. 2 *B*), although the form of the dosage curve is quite similar (in contrast to narcotine and papaverine, as illustrated in fig. 2 *C* and *D*). Twenty-one milligrams of codeine per kilogram of body weight reduced the spontaneous movements less than 10 per cent, while an equal quantity of morphine was completely sedative. The minimal tranquilizing dose of codeine (63 mg. per kilogram) was three times that of an equally effective dosage of morphine. However, 42 mg. of codeine per kilogram was 80 per cent sedative or, in other words, the near complete tranquilizing efficiency was only slightly less than one-half that of morphine. The potency relation therefore seems to vary somewhat with the degree of effect sought; i. e., codeine : morphine : : 1 : 2 or 3.

*Narcotine.*—Dosages of narcotine ranging from 4.2 to 126 mg. per kilogram were tested (fig. 2 *C*). No evidence of increased excitability was obtained over this range. The sedative effects noted were more variable and smaller in degree than with any of the other agents tested. The tranquilizing action was observed with the minimal dosage tested, but the rate of movement was reduced only approximately one third by the maximal dosage. The sedative efficiency of narcotine is probably less than one-fifteenth that of morphine. In dosages greater than the maximum indicated in the figure, an increased reflex excitability occurs so that the efficiency becomes even lower.

*Papaverine.*—The sedative effects of papaverine were apparent with all dosages tested. The efficiency increased but slightly with dosage and was incomplete even after medication with 126 mg. per kilogram of body weight (fig. 2 *D*). A numerical comparison of the tranquilizing effects of papaverine with those of morphine indicate that, on a weight basis, the one-half sedative efficiency of the former is approximately one-fifth, but for complete tranquilization the efficiency is considerably less than one-sixth that of morphine.

*Pantopon.*—The sedative effects of pantopon were compared with those of morphine on the basis of weight, therapeutic and actual morphine equivalence.

On the basis of weight, pantopon was one half as effective as morphine; i. e., a complete sedative action required 21 mg. of morphine or 42 mg. of pantopon per kilogram of body weight (fig. 3). On the basis of the advertised clinical or therapeutic equivalence, pantopon was less effective than morphine; i. e., the dosage of pantopon required for complete tranquilization was approximately 20 per cent greater than that usually accepted as being equally effective with morphine. This difference is exactly that which exists between the morphine content of a unit dosage of morphine and the corresponding therapeutic dosage of pantopon. No evidence was obtained that would indicate any significant activity on the part of the residual opium alkaloids contained in pantopon.

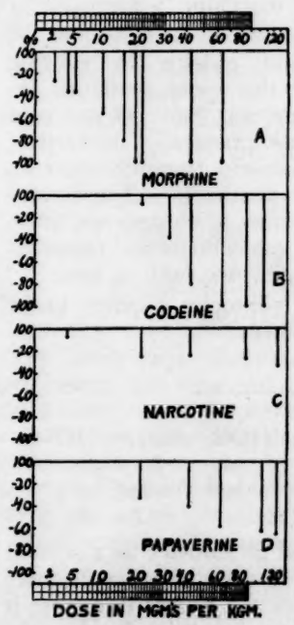


Figure 2

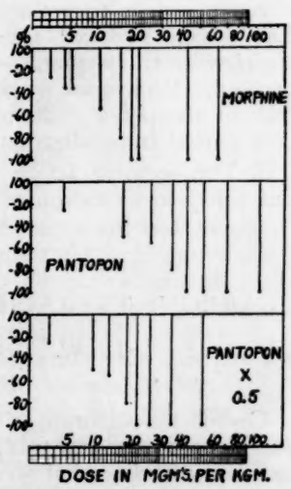


Figure 3

Figs. 2 and 3.—The data have been graphed on a semilogarithmic scale. The abscissas represent the dosages (subcutaneous) per kilogram of body weight. The ordinates represent the number of movements per minute in terms of percentage of the normal rate observed before medication.

## COMPARISON OF THE TRANQUILIZING ACTIONS OF MORPHINE AND PAPAVERINE ON THE VOLUNTARY AND INVOLUNTARY MOVEMENTS OF THE RAT

Observations on the tranquilizing actions of morphine or papaverine on the "reinforced" or pain movements which occur during a constant stimulation of the legs of the rat by means of a subtetanic faradic current as well as on the spontaneous movements of the same animal in the absence of stimulation indicated no remarkable difference between the reactions to unit dosages of the two alkaloids under the two experimental conditions.

The reactions of the animals that were stimulated differed somewhat from those of the nonstimulated series, in that the continuous stimulation of the normal animal resulted in greater muscular activity

(about five times normal) than occurred spontaneously in the absence of stimulation. Nevertheless, both the spontaneous and the "reinforced" movements disappeared after proper medication. Under such conditions, subnormal movements reappeared temporarily on beginning the stimulation but disappeared after from one to five minutes.

From the standpoint of simplicity as well as regularity of reactions on the part of the rats, the comparison of the spontaneous movements appear superior to that of the reinforced or pain reactions to electrical stimuli for studying the relative tranquilizing effectiveness of narcotics.

### CONCLUSIONS

1. The depressant effects of pantopon and the several alkaloids on the spontaneous movements of the rat indicate that the sedative action of the series has the following order, from high to low: morphine > pantopon > codeine > papaverine > narcotine.

2. Morphine, pantopon and codeine in suitable dosages completely inhibited the spontaneous movements of the rat. Papaverine was only 50 per cent effective, while narcotine was practically ineffective. The dosage required for complete tranquilization as compared with morphine = 1; pantopon = 2, and codeine = 3. Papaverine or narcotine in dosages six times that of morphine (126 mg. per kilogram) produced only partial tranquilization; i. e., one half or less.

3. The sedative action of pantopon appears to be due solely to its morphine content.

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## CARBON TETRACHLORIDE POISONING

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Carbon tetrachloride is used in industry as a solvent for gums, resins and fats; it is used as a dry cleanser and is a constituent of some of the rubber elements; it is used also to clean oil from machinery and, under the name of pyrene, as a fire extinguisher.[1] In medicine it is used as a vermifuge in the treatment of ankylostomiasis. Cases of poisoning have been reported from time to time. I have recently observed seven men who were affected by it, simultaneously, in a small plant where it was used as a solvent for cleaning.

Carbon tetrachloride ($CCl_4$) is a colorless, transparent liquid, like chloroform. It is insoluble in water and glycerin and is miscible with chloroform, alcohol and benzene. It is soluble in all fixed and volatile oils. It is volatile at ordinary temperatures but noninflammable.

Investigations as to the toxicity of carbon tetrachloride compared to chloroform have varied. Some investigators have reported it twice as toxic, and others about equally toxic.

It has been shown at the research laboratory of the bureau of mines[2] that, when carbon tetrachloride fire extinguishers are used in a closed room, subjected to high temperature such as would occur in a fire, deadly gases are formed. Phosgene gas, which is intensely poisonous, was formed in toxic quantities; chlorine in smaller amounts; hydrogen chloride also was formed, and there was considerable vapor of carbon tetrachloride. The experiments showed that it is extremely hazardous to employ carbon tetrachloride fire extinguishers on a hot fire in closely confined spaces.

Carbon tetrachloride, when used as a vermifuge, is not devoid of danger, especially in debilitated persons, persons addicted to alcohol, and those suffering from chronic cardiac, renal, hepatic and pulmonary diseases. Occasional poisonings have been reported, when used in therapeutic doses. Individual susceptibility plays a part.

Experimental work on dogs, by Minot and Cutler,[3] has shown that even in very large doses it did not produce an intoxication when the dogs were on a well balanced diet, that a comparatively small dose of the drug could produce fatal poisoning on a diet in which calcium was deficient, and also that cases of intoxication could usually be successfully treated by calcium therapy. They found that, on giving dogs from 3 to 4 cc. of carbon tetrachloride, per kilogram of body weight, made susceptible by a preliminary diet of lean meat without extra calcium, they usually had the following symptoms: In from fifteen to twenty hours there was slight malaise, some salivation and nausea, poor appetite, and diarrhea. After twenty hours the dogs became definitely ill and refused to move; there were some fibrillating tremors and visible twitchings of the paws and lips. Violent convulsions are sometimes seen; a foul, bloody diarrhea, with vomiting of changed or fresh blood, frequently occurs. They may go on to coma or profound weakness; death occurs in from forty-eight to sixty hours. The blood showed a hypoglycemia, with a retention of guanidine. The most obvious damage was in the liver. At autopsy, the liver appeared yellowish and was soft and friable. The gastro-intestinal tract usually contained old blood, with hemorrhagic areas in the pyloric end of the stomach and in the upper third of the small intestine. There is often some congestion noted in the kidneys. They also found that there was increased toxicity of carbon tetrachloride if alcohol was added to the diet.

They found that dogs poisoned by carbon tetrachloride could be successfully treated by intravenous injections of calcium chloride; that they would respond in from a few minutes to half an hour and become temporarily fairly normal, and that most cases could be permanently cured by a suitable course of calcium therapy. Calcium lactate could be given by mouth, if vomiting was not persistent. Ammonium chloride and hydrochloric acid were also effective, as well as parathyroid extract. The nervous symptoms were relieved and the blood sugar was restored to normal.

It was found that, by giving dogs a high calcium diet, with calcium lactate, for a period of from one to three weeks previous to administering the carbon tetrachloride, they were relatively immune to fatal poisoning.

In man, the most common symptoms reported in cases of poisoning, when administered as a vermifuge,[4] are nervous and gastro-intestinal irritability, as manifested by nausea, vomiting and diarrhea, accompanied by restlessness and periods of consciousness and unconsciousness, rise of temperature, and icterus due to its action on the liver and its appendages. This is due to fatty degeneration and necrosis of the liver cells, which is similar to that found in chloroform poisoning.

1. Hamilton, Alice: Industrial Poisons in the United States, p. 441.
2. Fieldner, A. C.; Katz, S. H.; Kinney, S. P., and Longfellow, E. S.: J. Franklin Institute **161**: 543 (Oct.) 1920.
3. Minot, A. S., and Cutler, J. T.: Guanidine Retention and Calcium Reserve as Antagonistic Factors in Carbon Tetrachloride and Chloroform Poisoning, J. Clin. Investigation **6**: 369 (Dec.) 1928.
4. Hernandez, A. V.: Carbon Tetrachloride Poisoning, Monthly Bull. Philippine Health Serv. **7**: 567 (Oct.) 1927.

Keher and Onendal [5] reported five fatal cases due to its use as a vermifuge, in the Dutch East Indies. They found, pathologically, destruction of large segments of liver tissue, with pericentral necrosis. All the liver cells in the peripheral portions of the lobules were infiltrated with fat droplets or fat globules. There was an acute venous stasis of the entire portal system, which caused the vomiting of blood, and swelling in the gastric system, with petechia of the visceral serous membranes. There was congestion of the spleen, and degeneration of the renal tissue. Icterus developed in two of these cases. In one of the fatal cases, only 5 cc. was given. In the other four, a repeat dose had been administered. The authors note that users of alcohol were extremely sensitive to this drug.

Mauro [6] reports that the symptoms of poisoning are usually at first irritative phenomena of the eyes and of the throat; then cough, nausea, a sensation of burning in the epigastrium, vomiting, headache, cerebral excitation, and finally narcosis and coma. In cases that are not acute, these symptoms are not marked, and after a few days there may be gastrohepatic symptoms, with icterus.

The seven cases of carbon tetrachloride poisoning that I observed occurred among the employees of a felt manufacturing plant. The patients were all Italians and were wine drinkers. Carbon tetrachloride was used to remove spots from the felt. This method was changed, and instead of using it to remove the individual spot, a large amount, about a 33⅓ per cent mixture of carbon tetrachloride, was placed in the vats through which the felt was passed while the fluid was still warm. This resulted in the outbreak of poisoning, in a few days. The men all complained of nausea and vomiting, which lasted from one to three days. Three vomited small amounts of blood; six had diarrhea; none passed blood that they knew about; five complained of headache; four complained of burning or smarting about the eyes or mouth; two had definite liver enlargement with jaundice; four had evidences of kidney irritation, one of which was an acute nephritis. This man also had bronchopneumonia. All these men have recovered. One of the men with jaundice had an icteric index of 12, two months after the poisoning, the jaundice being entirely cleared. Two months later the icteric index was 4. Two months after exposure the icteric index in the others was normal.

The man with the bronchopneumonia and acute nephritis was critically ill. His symptoms from the onset were more severe. He started with nausea, vomiting and diarrhea. Fever soon developed. On the fourth day there was congestion of the bases. The pulse became elevated and weak; the blood pressure was 182 systolic and 102 diastolic; the white blood cell count was 27,000. The urine showed an acute nephritis and the lungs a widespread bronchopneumonia. He was transferred to a hospital, where his condition became desperate. His face was swollen and his tongue heavily furred; the breath had a urinous odor; he was very restless, continually crying out; his hands were cold and clammy; the pulse was very rapid, weak and irregular; the heart sounds were of poor quality; both bases were flat on percussion, with râles, squeaks and bubbles throughout both lungs. There was a diffuse, large, almost blotchy, macular rash over the greater part of his body; he was passing very little urine; death seemed certain. Under stimulation of epinephrine, caffeine sodiobenzoate and digitalis, with calcium lactate, he gradually began to improve and finally recovered. Four months after the exposure, he was up and about; his weight was normal, and he looked well. Physical examination at this time was negative. The liver was not enlarged. The icteric index was 5. He still complained of gastric distress and weakness.

5. Keher, J. K. W., and Onendal, A. J. F.: Poisoning with Carbon Tetrachloride, Nederl. tijdschr. v. geneesk. **70**: 746-757 (Aug. 14) 1926.

6. Mauro, G.: Intoxication Caused by Carbon Tetrachloride, Clin. med. ital. **61**: 192-201 (March-April) 1930.

### CONCLUSIONS

1. Carbon tetrachloride may be, and often is, a serious poison.
2. The liver and the gastro-intestinal tract are the organs most commonly damaged.
3. Calcium deficiency and the use of alcohol render an individual much more susceptible.
4. Calcium therapy is particularly indicated in treatment.

395 Commonwealth Avenue.

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## SUBDURAL HEMATOMA IN INFANTILE SCURVY

### REPORT OF CASE WITH REVIEW OF LITERATURE

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AND
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The hemorrhagic diathesis of scurvy has been recognized since the time of Hippocrates. Hemorrhage occurs most commonly beneath the periosteum of the long bones and into joint spaces but frequently involves the skin, mucous membranes, orbits and serous cavities. Reports of hemorrhage associated with the meninges during the active scorbutic state are sufficiently rare to deserve note. The occurrence of subdural hemorrhage in a case of infantile scurvy, in which an operation was performed in this hospital, has led us to review the literature for similar cases.

Willis,[1] an English physician, in a treatise on scurvy published in 1668, mentioned the occurrence of intracranial hemorrhage in the course of this disease, an observation that was apparently based on pathologic examinations. Two hundred years later, in 1871, in a review of the pathologic anatomy of scurvy, Hayem [2] presented the first case of hemorrhagic pachymeningitis associated with scurvy.

To Sutherland,[3] however, must be attributed the first accurate clinical and pathologic report of this condition. In 1894 he described the case of a rachitic and scorbutic infant of 14 months who developed one month before death rigidity of the right arm, followed by an intermittent tonic spasm of the muscles of this arm and conjugate deviation of the eyes to the right. At autopsy there was found in the subdural space a dense, fibrinous mass, loosely adherent to the undersurface of the dura. Beneath this lay a layer of "soft, coagulated lymph," which was separated from the first tissue by a dense, white membrane. The spinal canal

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1. Willis, T.: In Quo Agitur de Morbis Convulsivis et de Scorbuto, Pathologiae Cerebri et Nervosi Generis Specimen, 1668.
2. Hayem, M. G.: Note sur l'anatomie pathologique du scorbut, Gaz. Méd. de Paris **26**: 126 (April) 1871.
3. Sutherland, G. A.: On Hematoma of the Dura Mater Associated with Scurvy in Children, Brain **17**: 27, 1894.

likewise revealed a deposit of soft, reddened gelatinous material lying just beneath the dural covering. The same paper also includes the history of a 2 year old girl who, in addition to the usual picture of scurvy, presented on the second day of admission rigidity of the neck, dilated pupils, deviation of the head and eyes to the left and spasmodic contractions of the muscles of both arms. An autopsy the following day revealed a large blood clot over the superior surfaces of the brain bilaterally. This clot lay between dura and cortex (relation to arachnoid membrane not specified) and stained the surface of the cortex. The extravasation beneath the dura was evidently of some duration, as a considerable degree of organization was present. An additional finding of interest was the appearance of two subcortical hemorrhages, a condition not described elsewhere in the literature.

Several months later, Wallis Ord [4] reported before the London Pathological Society an autopsy record of a case of infantile scurvy, showing an extensive subdural hemorrhage occupying the whole cranial vault. Clinical signs of increased intracranial pressure had not been elicited.

In 1896, Meyer [5] described another true case of pachymeningitis hemorrhagica interna. The patient was an infant, aged 9 months, who presented clinical signs of both rickets and scurvy. No localizing neurologic signs were demonstrated, yet autopsy revealed on the under surface of the dura a fibrinous, hemorrhagic exudate containing localized accumulations of thin, watery fluid. The arachnoidal membrane was edematous, and both lateral ventricles showed slight enlargement.

A case of subdural hemorrhage in the spinal cord was reported by Feigenbaum [6] in 1917. The patient, a German soldier, aged 30, following a month's course of typical scurvy developed the signs of a transverse cord lesion of marked degree. Under adequate diet the external bleeding stopped, but neurologic signs showed no tendency to regress and the patient eventually died of sepsis. At autopsy a flat, partially organized subdural hemorrhage was discovered anterior to the cord, extending from the sixth to the tenth thoracic segment. There was also an extensive hematoma lying between the nerve roots in the subarachnoid space. Microscopic examination showed various stages of organization of a blood clot. The last two cases more nearly simulate the entity described by Virchow as pachymeningitis hemorrhagica interna than any of the other descriptions recorded here.

The last reported case of subdural hematoma was offered by Sammis [7] in 1919, occurring in a malnourished infant of 1 year, with unmistakable signs of rickets and scurvy. A general clonic convulsion was followed by death four hours later. Autopsy revealed a blood clot over the left postcentral gyrus, lying definitely between dura and arachnoid.

In addition to these seven recorded cases of subdural hemorrhage, we have found three reports of extradural bleeding in scurvy. Möller [8] in 1862 described a large extradural clot causing marked compression of the underlying cortex. The dura at this point was definitely thickened and displayed increased vascularity. Two similar cases were given by Sato and Nambu [9] in 1908 and by Glauber [10] in 1928.

Scherer [11] in 1913 reported thirteen autopsy records obtained within the course of a few months on young adults with scurvy, whose ages ranged from 20 to 25 years. Twenty-five per cent of the examinations revealed intracranial hemorrhage of one type or another. In none of the cases was there any evidence of trauma or of inflammatory change which might be considered of etiologic significance. The report did not include the relationship of the hemorrhages to the meninges but, judging from the description, they were probably extradural.

Several other contributions have been found presenting patients whose clinical picture suggested the presence of hemorrhage with pressure on the brain or cord. These cases lacked pathologic or operative confirmation. The American Pediatric Society's collective investigation of infantile scurvy in 1898 [12] embodied a thorough study of 379 cases with 29 deaths. Cerebral hemorrhage was given as the cause of death, based on clinical evidence, in three cases. None of the six cases that went to autopsy showed any cerebral or spinal lesions. Hess and Fish [13] in 1914 mentioned a case under their care in which, during the course of the disease, twitchings of the muscles, convulsions and urinary bleeding developed. A lumbar puncture showed a blood-tinged spinal fluid, but no further evidence of the site of the blood clot or localized accumulation of fluid producing symptoms was to be had.

Von Noorden [14] in 1889 and Prakken [15] in 1925 each reported a case of scurvy characterized by the onset of neurologic signs of pressure on the spinal cord and disappearance under antiscorbutic treatment. Hemorrhage about the cord, though strongly suspected in both cases, was not definitely proved.

The cases herein reported indicate that cerebral complications in scurvy are unusual but by no means unknown. The 25 per cent incidence in Scherer's small group is surprising and not confirmed by other series. The most extensive collection of autopsies on scorbutic children which we have found is that of Sheldon,[16] numbering nineteen, in which no instance of intracranial bleeding was encountered.

Our case adds one more to the list of seven proved cases of subdural hemorrhage in scurvy, and it possesses the additional interest of being the first reported case in which the diagnosis has been confirmed by operation.

## REPORT OF CASE

*History.*—E. M., an American boy, aged 16 months, was brought to the Strong Memorial Hospital, July 10, 1931, because of irritability and loss of appetite.

The patient was born spontaneously in the seventh month of pregnancy. The birth weight was 4½ pounds (2,041 Gm.). Breast milk was given for two months, followed by a sweetened formula of diluted pasteurized cow's milk for ten months. Whole milk was introduced during the four months prior to

4. Ord, Wallis: Proceedings of the Pathological Society of London, Brit. M. J. **2**: 1430 (Dec.) 1894.
5. Meyer, E.: Ueber Barlowsche Krankheit, Arch. f. Kinderh. **20**: 202, 1896.
6. Feigenbaum, D.: Ein Beitrag zur Kenntniss der Rückenmarksblutungen beim Skorbut, Wien. klin. Wchnschr. **30**: 1455 (Nov.) 1917.
7. Sammis, J. F.: A Case of Scurvy with Cerebral Hemorrhage, Arch. Pediat. **36**: 274 (May) 1919.
8. Möller: Zwei Fälle von akuter Rachitis, Königsberg. med. Jahrb., 1862-1864, (3-4), p. 135.
9. Sato and Nambu: Zur Pathologie und Anatomie des Skorbuts, Virchows Arch. f. path. Anat. **194**: 151 (Oct.) 1908.
10. Glauber, Richard: Zur sogenannten Pachymeningitis haemorrhagica interna, Monatschr. f. Kinderh. **38**: 293, 1928.
11. Scherer: Ueber Skorbut in Deutsch Südwest Afrika, Arch. f. Schiffs- u. Tropen-Hyg. **17**: 191 (March) 1913.
12. American Pediatric Society's Collective Investigation on Infantile Scurvy in North America, Tr. Am. Pediat. Soc. **10**: 5 (June) 1898.
13. Hess, A. F., and Fish, Mildred: Infantile Scurvy, the Blood, Blood Vessels and Diet, Am. J. Dis. Child. **8**: 385 (Dec.) 1914.
14. von Noorden: Zur Aetiologie und Pathologie des Scorbuts, Deutsche med. Wchnschr. **15**: 261 (March) 1889.
15. Prakken, J. H.: Een Geval van Scheurbuik met Ruggemergsbloeding, Nederl. Tijdschr. v. Geneesk. **2**: 1796 (Oct. 17) 1925.
16. Sheldon, W. P. H.: Intracranial Hemorrhage in Infancy and Childhood, Quart. J. Med. **20**: 353 (July) 1927.

entry. Cod liver oil had been given daily since early infancy. Orange juice and tomato juice were given on an average of once a month because their more frequent use was associated with a recurring diarrhea. Cereals and vegetables were not taken. The general nutrition was considered consistently poor.

At eleven months he had a bilateral, suppurative otitis media of one week's duration.

The father and mother are living and well. The Kahn reaction of the parents' blood is negative. Two premature siblings are living and well. One infant died thirty hours after birth.

At 15 months of age, four weeks prior to entry, anorexia and general irritability became pronounced. Tenderness of the lower extremities was noted at this time.

*Examination.*—The temperature was 37.6 C. (99.7 F.); the weight was 5.9 Kg. (13 pounds). The child was poorly developed, dehydrated and slightly anemic. The occiput was flattened and the fontanels were closed. A slight bilateral internal strabismus was present. The gums were congested. A rather angular type of beading at the costochondral junctions was observed. There was slight generalized enlargement of the lymph nodes. The legs were tender and held in flexion and external rotation. The right knee was swollen and painful on motion. In other respects the general examination was not abnormal.

The red blood cells numbered 4,400,000; hemoglobin was 55 per cent; the white blood cells numbered 12,600. The urine and Wassermann tests were negative. Chemical examination of the blood revealed: calcium, 10.6; phosphorus, 4.5; magnesium, 1.6 mg. per hundred cubic centimeters. A roentgen study of the long bones showed the characteristic picture of scurvy.

*Course.*—The child took daily from 30 to 90 cc. of orange juice with potassium citrate and, for the anemia saccharated ferrous carbonate and copper sulphate. During the next week the gums became normal, the extremities lost their tenderness, and roentgen evidence of calcium deposit in the long bones became manifest. July 20, ten days after admission, the temperature rose to 39.8 C. (103.6 F.), the white blood cell count was 20,600 and diarrhea occurred. Nonprojectile vomiting was frequent during the next three days.

July 25, the vomiting became projectile. Twitching of the right side of the face and rolling of the eyes was observed, but further neurologic signs were not apparent until two days later, when internal strabismus increased and dilatation of the left pupil occurred. Lumbar puncture revealed xanthochromic fluid under a pressure of 400 mm. of water. The diagnosis of left pachymeningitis hemorrhagica interna or of subarachnoid hemorrhage was made.

July 28, a burr hole in the left parietal region was made under local anesthesia. The dura appeared to be under moderately increased tension and congested. When the dura was incised, about 60 cc. of definitely xanthochromic fluid gushed forth. The cortex was separated from the overlying dura by approximately one-half inch. A drain was inserted to the subdural space and closure effected with silk.

Postoperative laboratory studies showed a normal bleeding and clotting time. A roentgenogram of the skull gave no evidence of subperiosteal hemorrhage.

Following operation the strabismus decreased, the facial twitchings ceased and the patient became more alert. The wound drained profusely until the removal of the drain, August 4. At this time the brain cortex was found to be almost flush with the dura. Convalescence was delayed by several attacks of vomiting associated with loss of weight. Lumbar punctures at intervals showed a gradual return of spinal fluid pressure to normal. Following the removal of the drain, the cranial wound was tapped daily. Xanthochromic fluid was always obtained, at first under increased pressure, but gradually the normal dynamics returned.

By the end of August the wound had healed, the neurologic examination was normal, the hemoglobin, aided by several transfusions, had reached 75 per cent, and the patient was steadily gaining weight. He was discharged, September 14.

Except for a minor gastric disturbance shortly after discharge, the child has continued to improve. No further neurologic changes have appeared. Jan. 6, 1932, when last seen, the internal strabismus was of the same degree as noted on the admission examination. Mentally he was much brighter and more alert.

SUMMARY

In a case of infantile scurvy, signs of intracranial bleeding developed during the period of hospitalization. At operation a subdural sac of xanthochromic fluid was found and drained, with subsequent complete recovery.

A review of the literature has revealed thirteen other proved cases of intracranial hemorrhage in scurvy, seven being subdural, three extradural and three unclassifiable. Five of the seven cases of subdural bleeding were found in infants or young children.

It is hoped that this emphasis will call attention to the possibility of intracranial complications in scurvy and to the advisability of early exploratory operation in cases presenting localizing signs of increased intracranial pressure.

## *Clinical Notes, Suggestions and New Instruments*

### HEMOPHILIA: PREVENTION AND TREATMENT OF BLEEDING WITH OVARIAN EXTRACT

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Following the announcement by Carroll L. Birch[1] of the discovery that a hormonal disturbance exists in hemophilia which is temporarily relieved by parenteral administration of ovarian substances, the opportunity presented itself to us in a case of that disease to test the efficacy of ovarian extract for controlling dangerous spontaneous bleeding and to gather data of possible future assistance for safeguarding against persistently bleeding hemophiliac patients who need surgical operations. The potential value to surgery of such clinical applications of Birch's discovery is obvious. The data from this case are reported without waiting for more material, since the disease is uncommon[2] and prompt standardization of the surgical methods will require that data from many sources be pooled in the literature.

Birch gave daily injections of ovarian extract for eight months to one person with hemophilia and abolished the abnormal tendency to bleeding during that period and for two and one-half months afterward. A second patient was treated by ovarian extract for one month and then received a graft of fresh human ovary into the anterior abdominal wall. Examination of the blood gave normal results for five months. Neither the dosage of the extract used nor the details of the effects on blood coagulation were published. This investigator showed, furthermore, that the urine of hemophilia patients differed from that of normal males by the absence in the former of appreciable amounts of female sex hormone.

#### REPORT OF CASE

*History.*—A Chinese boy, aged 10 years, had been admitted to the hospital twice previously in six years for uncontrolled bleeding from superficial abrasions. The bleeding was stopped each time with great difficulty, chiefly by transfusions of whole blood, but only after development of severe degrees of exsanguination. The diagnosis of hemophilia was made from these symptoms and from the laboratory observations of marked delay in clotting time and clot retraction time, of normal bleeding time, and of the normal number of platelets. It was supported by the discovery that a younger brother had a similar history. Other male members of the family could not be secured for examination. A point of interest, which has

From the Department of Surgery, Peiping Union Medical College.

1. Birch, C. L.: Hemophilia, Proc. Soc. Exper. Biol. & Med. **28**: 752 (April) 1931; Hemophilia and Female Sex Hormone; Preliminary Report, J. A. M. A. **97**: 244 (July 25) 1931.

2. Only two other cases have been seen in this clinic in ten years.

been the subject of another report,[3] was that two years previously the patient received a blow on the flexor muscles of the right forearm and developed an intramuscular hemorrhage that led to a Volkmann's contracture. Three days prior to the present admission of the patient, he fell and scratched the lower lip, whereupon bleeding commenced and continued without interruption.

The boy was normally nourished and developed, but pale and weak. The lower lip was slightly swollen and presented a small slowly bleeding ulcer in the mucous membrane near the margin. The only other physical abnormalities were a faint systolic murmur over the heart and the Volkmann's contracture. The erythrocyte count was 2.7 millions, and the hemoglobin estimation (Sahli) 50 per cent. Since the diagnosis was already known and treatment was needed primarily, further blood tests were postponed.

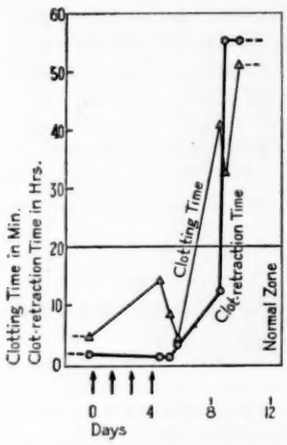


Chart 1.—Effects on blood coagulation of repeated intramuscular injections, once daily, of 4 grains (0.26 Gm.) of ovarian extract. Here, as in the other charts, arrows indicate the time of the injections.

*Treatment.*—An intramuscular injection of 4 grains (0.26 Gm.) of ovarian extract[4] was given at once. The bleeding became less rapid but failed to stop, and the injection was repeated at twelve hours. Bleeding ceased at fourteen hours but returned at twenty-four hours. A third injection at that time was followed in thirty minutes by permanent cessation of bleeding. One injection was then given every twenty-four hours for the next six days, and the ulcer healed rapidly. A dry dressing to protect the ulcer and routine nursing care constituted the only other forms of treatment. During the last four days of injections and the following six

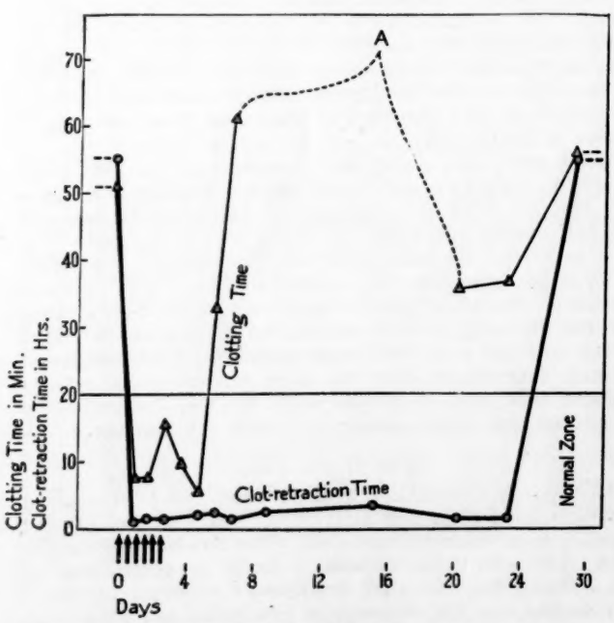


Chart 2.—Effects of repeated injections, twice daily, of 4 grains of ovarian extract. *A* represents 140 minutes.

days, the blood was tested repeatedly for clotting time and clot retraction time.[5] The readings are given in chart 1. They were normal during the period of the injections and two days afterward. Four days after stopping the treatment the clotting time was prolonged to forty minutes, whereas the clot retraction time was still within the normal range. The day after that, both readings were abnormal, the clotting time being thirty-four minutes and the clot retraction time fifty-four hours. Six days after treatment was discontinued, both readings had assumed the high levels, i. e., fifty minutes for clotting time and fifty-four hours for clot retraction time, which proved to be natural to the patient. It was found from repeated tests during the fourteen days of rest that followed that the bleeding time[6] and platelet count[7] were normal, while the fragility of the platelets[8] was greatly decreased.

*Experiments in Prophylaxis.*—After this the patient was without symptoms and largely recovered from anemia. He was induced to remain six weeks longer for the performance of three more tests as to the effects of intramuscular injections of ovarian extract. Other dosages than the dosage already given were used, and the experiments were separated by intervals sufficiently long to allow between the tests the blood to return to its natural state of coagulability, any probable accumulation of ovarian extract in the system to leave, and the punctured superficial veins to heal. The boy's veins were difficult of approach by needle at best, and phlebotomy was not justified, so the examinations had to be limited in frequency and confined to the more important considerations; namely, clotting time and clot retraction time. The results of the tests were as follows:

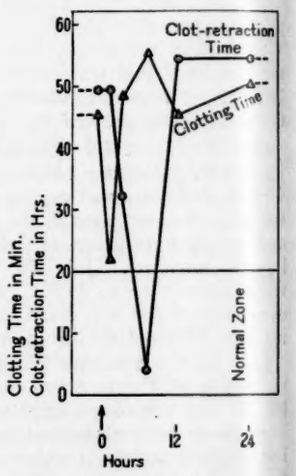


Chart 3.—Effects of one isolated injection of 4 grains of ovarian extract.

1. Six 4-grain doses were given twice daily (chart 2). Before injection, the clotting time was fifty-one minutes and the clot retraction time was fifty-five hours. The next day, just before the third injection, both readings were well within the normal zone. The clotting time remained normal through the first five days, which was two days longer than the treatment lasted, then rose rapidly and reached approximately the initial level in two days. Readings were omitted after that until the fifteenth day, when the clotting time was more than twice as long as at first. This was followed by a swing back to points somewhat below the initial level and then by a swing up to the initial level. The clot retraction time remained normal throughout the period of treatment and for twenty days afterward. On the twenty-ninth day, it stood at the initial level.

2. One isolated 4-grain dose was given (chart 3). Before injection, the clotting time was forty-five minutes and the clot retraction time, forty-nine hours. One hour after injection, the clotting time was twenty-two minutes, which was just above the normal zone, but the clot retraction time was unaltered. Then the value of the first function began to rise and that of the second to drop, until at seven hours they were fifty-five minutes and four hours, respectively, the first being distinctly above its initial level and the second being within the normal zone. At twelve and twenty-four hours, both values stood approximately at their initial levels.

3. One isolated 8-grain (0.5 Gm.) dose was given (chart 4). To begin with, the clotting time was sixty-five minutes, and the retraction time, thirty-six hours. One hour after injection the first value was slightly lower but still markedly abnormal, while the second was well within the normal zone. Practically the same values were found to exist for the next thirty-five hours. At sixty hours, the clotting was approximately at the

3. Shih, H. E.: Volkmann's Contracture with Report of Case, Nat. M. J. China **17**: 315-22 (June) 1931.
4. "Azoule," prepared by Allen & Hanburg, Ltd., London.
5. Lee, R., and White, P.: A Clinical Study of the Coagulation Time of Blood, Am. J. M. Sc. **145**: 495, 1913.
6. Duke, W., quoted from Morris, R.: Clinical and Laboratory Diagnosis, New York, D. Appleton and Company, 1924, p. 276.
7. Reiman, H. A.: The Blood Platelets in Pneumococcus Infections, J. Exper. Med. **40**: 553 (Oct.) 1924.
8. Birch (footnote 1, first reference).

initial level, but the clot retraction time was still normal. At seventy-two hours, both readings had returned approximately to their initial levels.

### CONCLUSIONS

Because venipuncture could not be done as often as required, the exact duration and extent of the effects of the injections on blood coagulability were not determined, but certain general influences were discerned:

1. Repeated intramuscular injections of ovarian extract influenced profoundly the coagulability of the blood of this hemophiliac patient; they stopped a hitherto uncontrolled and severe hemorrhage and they reduced the laboratory readings of blood coagulability to normal.

2. Isolated injections had definite but incomplete effects. At least two doses spaced from twelve to twenty-four hours apart were required to bring the laboratory readings to normal, and three doses in a period of twenty-four hours were necessary for permanent control of spontaneous bleeding. This suggested an accumulative action of the drug.

3. The effects of an isolated dose of 4 grains were practically the same in magnitude as those of one of 8 grains; the effects of a series of injections with 4 grains given once daily were the same in magnitude as those of a series with 4 grains twice daily. This was true of both clotting time and clot retraction time.

4. The effects of both isolated and repeated injections were maintained for some time after treatment was stopped, and they tended to be followed by a brief period with coagulation delayed longer than natural, before the coagulation returned to the natural state. The effects were maintained longer in respect to clot retraction time than to clotting time, after 8 grains than after 4 grains, and after twice daily than after once daily doses.

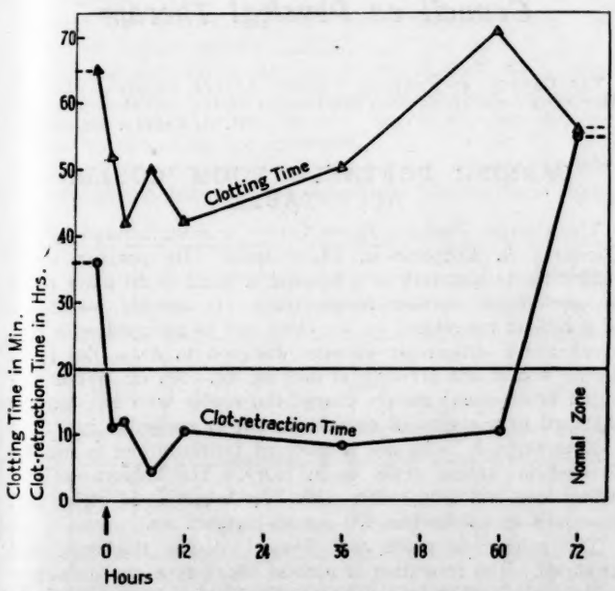


Chart 4.—Effects of one isolated injection of 8 grains of ovarian extract.

5. Experience with many more cases is required before the treatment and prophylaxis of bleeding in hemophilia can be standardized, but until this is at hand the following suggestions are made: Treatment may consist in intramuscular injections of 4 grains, begun immediately and continued at intervals of six hours until bleeding stops, and then at intervals of twenty-four hours until the wound is healed. The wound should receive the ordinary surgical care. Patients may be prepared for surgical operations by three injections, each of 4 grains of extract, the first being given twenty-four hours, the second twelve hours, and the third two hours before operation. If time permits, it might be better to give daily injections of 4 grains for two or three days before the operation, in addition to one injection two hours before operation.

### SUMMARY

In a case of hemophilia, a prolonged period of spontaneous bleeding was terminated by intramuscular injections of ovarian extract and a series of experiments was performed to determine the effects of various doses of ovarian extract on the coagulability of the blood. The data obtained provided information of possible value in developing standard methods for prevention and treatment of persistent bleeding in this disease —bleeding that occurs from either accidental or surgical wounds.

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## OBSERVATIONS ON A PATIENT TO WHOM SPINAL ANESTHESIA WAS ADMINISTERED FIVE TIMES WITHIN THIRTY-EIGHT HOURS

WILLIAM M. SULLIVAN, JR., M.D., NEW YORK

The history reported here illustrates many interesting points in urinary physiology and suggests that spinal anesthesia, even though frequently repeated, is harmful only in proportion to the lack of skill of the anesthetist. The urologic history is long and has been greatly condensed.

R. M., a man born in 1891, a railroad employee, had hematuria and attacks of colic in the right loin for four years when, in 1922, the right kidney was removed. It was said to contain a large stone. The following year he had a urethral discharge, which continued until 1928. An abscess discharged through the perineum. In 1929 he was first seen by Dr. Keyes and operated on twice under spinal anesthesia (procaine hydrochloride) at a four weeks interval for urethral stricture and perineal abscess. Both lesions were relieved, though the perineum, after healing promptly and almost completely, still showed a pin hole fistula in the summer of 1930. Since that time many urethral instruments have been passed without encountering any obstruction and there has been no bladder retention of urine. The urethral and prostatic history has no bearing on the points under discussion.

In August, 1929, however, after brief pain in the left loin, he had anuria for twenty hours. The plain roentgenogram was negative, the pyelogram inconclusive as to the presence of stone and a normal kidney pelvis, but a number 6 ureteral catheter at 25 cm. up the left ureter passed a definite obstruction and drew 10 cc. of pus and urine.

An indwelling ureteral catheter was left for twenty-four hours. When this ceased to function the catheter was withdrawn and anuria recurred. Twelve hours later a vain attempt was made to reinsert the ureteral catheter into the kidney pelvis, and under spinal anesthesia (procaine hydrochloride) the left kidney pelvis was opened and a small urate stone milked upward from a point about 2 cm. down the ureter. There were many soft adhesions around the kidney at this time. The loin wound healed in twenty days.

In June, 1930, the renal symptoms recurred; and although a roentgenogram then was negative and the ureteral catheter drew clear urine which contained only scattered pus cells and detected no retention in the kidney pelvis, a month later phosphatic stones were visible to x-rays and by September had grown to fill the kidney pelvis.

With the growth of the stone the phenolsulphonphthalein output diminished from 25 per cent in thirty minutes after intravenous injection in June to 12 per cent in September. It has remained low since that time, varying from 8 per cent in September, 1931, to one count of 20 per cent in March of the same year. But during 1930, the nonprotein nitrogen of the blood remained approximately 40 Gm. per hundred cubic centimeters.

In view of the difficulty anticipated in reoperating on the left kidney and with the prospect of recurrence of renal stone, operation was deferred although the patient was becoming more and more incapacitated by irregular fever due to pyelonephritis and occasionally accentuated by left epididymitis and was bleeding from the kidney a good part of the time.

His chief complaint, however, was the great pain and frequency of urination. When this increased to every hour he was put in the hospital, in October, 1931, and bladder decompression was established. Within a week the bladder spasms were relieved but within a month they had recurred.

Nov. 12, 1931, therefore, he returned to the hospital worn out with pain, urinating three or four times an hour, usually with spasm, and passing urine which usually was bloody. Though his condition was considered desperate it is to be noted that from his normal weight of 170 pounds (77 Kg.) he had lost only 10 pounds (4.5 Kg.) and the nonprotein nitrogen, though it had been as high as 72 in September, was only 56 in October and 64 on entrance to the hospital.

For three days, bladder decompression was attempted in vain. Spasms in the bladder and hematuria were constant. In order to relieve the patient of his incessant pain, nephrotomy was done on the left kidney under nupercaine spinal anesthesia, December 15. The kidney was embedded in such extremely dense adhesions that the better part of an hour was spent in freeing its lower pole and opening into the lowest calix and removing a phosphatic stone from this. But the hilus had not been disclosed, nor the kidney pelvis, and the neck of the calix could not be found because of bleeding from the parenchyma. Therefore, no further attempt was made to extract the stone, and the operation was completed by suturing a small tube into the lower calix.

During the ensuing week the nonprotein nitrogen rose to 54, and the creatinine to 2.77, on the fifth day the patient was semicomatose but revived after an intravenous injection of dextrose. The urinary flow varied, sometimes chiefly from the loin, sometimes chiefly from the bladder. Hematuria was mild, the patient quite comfortable. The indwelling catheter was continued.

At 8 p. m., December 22, strangury returned and the bladder filled with clot. Nupercaine spinal anesthesia relieved the pain, and the clots were emptied out. This relief lasted but five hours, when the strangury recurred and a second spinal anesthesia again relieved this. A litholapaxy tube was introduced and no clots were obtained. This second spinal anesthesia gave relief for fourteen hours, at which time the pain again recurred and the third spinal anesthesia was given, which relieved him for eleven hours; then a fourth, which relieved him for six hours; then a fifth, at which time the bladder was opened suprapubically and a large quantity of blood clot emptied out of the bladder.

At this fifth spinal anesthesia within thirty-eight hours, the blood pressure before anesthesia at 11:20 a. m. was 122 systolic and 72 diastolic; after spinal anesthesia at 11:35 it was 120 systolic and 60 diastolic. It then rose at 11:40, as a result of the prespinal ephedrine, to 160/90 and the readings every ten minutes thereafter were 146/88, 152/82, 160/90 and 150/80 (at 12:20 p. m.). At 1 o'clock it was 140/70, at 1:30 it was 112/62 (pulse 120) and at 4:30 it was 108/40. The patient thereafter was entirely comfortable and suffered no inconvenience at any time from the spinal anesthesias. The spinal fluid cell count at the last anesthesia was 40, white and red cells mixed. The globulin showed a slight increase.

The patient made a rapid recovery; the loin wound healed. The suprapubic tube has remained in place and the urine has shown blood, but once the chemical examination of the blood has given normal results. December 29, Dr. Sheehan did a complete neurologic examination and was unable to find any reflex, sensory or other changes.

In March, 1932, the patient stated that he felt better than he had at any time in the last three years. He has not attempted to do any work.

COMMENT

1. Spinal anesthesia is used from time to time for the relief of acute ureteral or intestinal obstructions. The history given is contributed as evidence that it may be practicable to repeat the spinal anesthesia a number of times at short intervals without appreciable harm to the patient.

As stated at the beginning of this paper, the harm done by spinal anesthesia is probably proportionate to the lack of skill of the anesthetist.

2. The pathologic physiology of bladder and of renal retention and the relief of symptoms by splinting the bladder or by releasing insignificant obstructions is illustrated in many departments of urinary surgery. Thus, most treatments applied to the urethra or the ureter seem to owe their efficacy to mechanical rather than to chemical qualities. The striking and commonplace examples of this are the cutting of the urethral meatus to secure adequate drainage for the cure of chronic urethritis and the passage of the ureteral catheter to relieve infection of the kidney pelvis.

The case cited illustrates the adequacy of suprapubic drainage to relieve an intolerable situation. Repeated observations had shown that the bladder emptied itself always down to a few cubic centimeters. Under such circumstances and in the absence of bladder lesions, as certified by cystoscopy, there seemed every reason to believe that the repeated hemorrhages came from the kidney pelvis and that when the bladder splint (decompression), which had once subdued the symptoms for a short while, failed on a second trial the only hope of relief would be nephrostomy. Yet the event proved that, probably because the drainage by an indwelling ureteral catheter never quite kept pace with the hemorrhage, the suprapubic tube was required to abate the symptoms.

3. The patient is delighted, though not well. No great regret is felt that at the last operation on the kidney the stone was not all removed, for it surely would have recurred. From experience with similar cases in the experience of Dr. Keyes, it seems quite possible that the patient has a great expectation of life on condition that his physical exertions are somewhat restricted. The kidney is full of stone but its parenchyma is considerable in quantity and adequate in function. The stone has already set in such a way as to fill the pelvis and calices. It will be interesting to observe whether the little difference in facility of drainage through the suprapubic tube as compared to the urethra insures him for the future against the bleeding from which he has suffered so much in the past.

327 East Sixtieth Street.

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# Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

H. A. CARTER, Secretary.

## CARRIER PORTABLE ROOM COOLER ACCEPTABLE

The Carrier Portable Room Cooler is manufactured by the Carrier-York Corporation, Philadelphia. Its purpose is to reduce the temperature of a hospital, a home or an office room to comfortable summer temperatures. It consists essentially of a cabinet resembling an ice chest and is equipped with two small motor driven air blowers designed to draw the room air by and in the presence of melting ice. No difficult installation is required; merely charge the cooler with ice, connect the cord to a source of current, and it is ready for use.

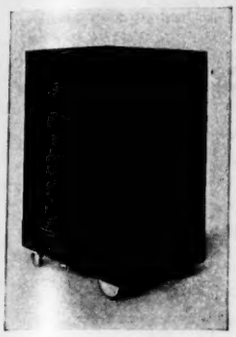
Externally, it looks like a piece of furniture and is usually finished in walnut grain or in ivory. The cabinet is 37⅝ inches long and 24⅝ inches wide. Its height is 52 inches and it weighs approximately 400 pounds without ice.

The cabinet is made out of steel, double thickness, and insulated. The insulation is pressed board type approximately one-half inch thick, the purpose of which is to prevent condensation or "sweating" on the outside of the cabinet.

The firm claims that 300 pounds of ice will operate the cooler at full capacity under hot weather conditions for about five hours. Regulation of the louvers on the air discharge will cause the ice to last longer but will cut down on the efficiency. The actual cooling is accomplished by two small blowers drawing the air from the room between the fins of a special metal grid on which the ice rests. The ice melts down between these fins in ridges and the air, coming in contact with the cold grid and the ice, is cooled. This cooled air is then distributed out into the room by means of the same blowers. The quicker the ice melts, the more the cooling. The rate at which the ice is melted determines the capacity of the unit. When the unit is not in operation, i. e., when the fan is not running, the ice in the cabinet melts, it is claimed, at the rate of from 4 to 6 pounds per hour. The manufacturer

claims that at an average of 5 pounds per hour, only 50 pounds of ice would melt if the unit stood idle for ten hours.

The Carrier-York Corporation asserts that the cabinet has sufficient capacity to produce a comfortable summer condition in a room having 300 square feet of floor area with a 10 foot ceiling. Thus the room has a volume of 3,000 cubic feet. In larger rooms having unusually bad sun exposure, many electric lights or other equipment giving off heat, and a number of persons present, more than one unit may be required. Under no circumstances can a single unit be expected to cool satisfactorily a room of more than 4,000 cubic feet. Obviously, a ward in a hospital could not be cooled by one unit. Several units would be required.



Carrier Portable Room Cooler.

The cost of operation may be determined by applying to the local ice companies for the rates. Roughly, the rates vary from 20 to 40 cents per hundred pounds. At an average cost of, say, 30 cents per hundred pounds, one loading of 300 pounds would cost 90 cents, and if operated for the average period of, say, ten hours, the cost per hour would be 9 cents.

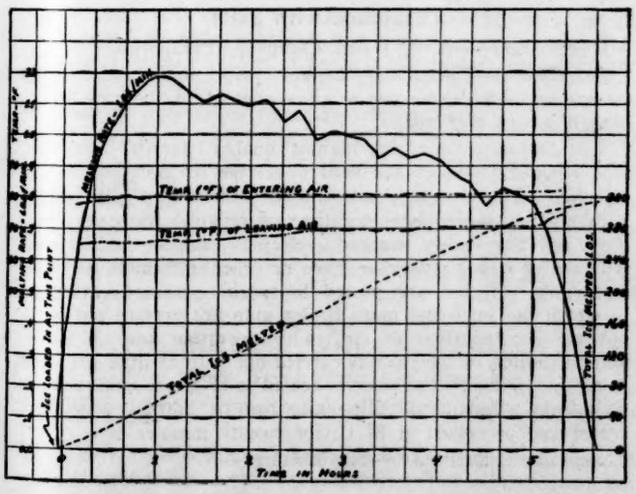
The motor is one-fiftieth horse power. It requires about the same amount of electrical energy to run as a 60 watt lamp. The approximate cost is 0.25 cent per hour.

The performance curve is shown in the accompanying chart. By a Council experiment, the curve was checked to within the limits of experimental error. The Council found that the temperature of the air passing through the unit was reduced from 9 to 12 degrees.

The same test shows that the blowers displaced about 500 cubic feet of air per minute.

A large compartment at the base of the unit affords storage space for the water formed by the melting ice, plus the moisture, which is taken out of the air. Hence the humidity in the room is reduced by the apparatus.

The manufacturer recommends three ways of emptying the water out of the base: First, wheel the cabinet to a floor




Performance curve.

drain and open the drain valve in the base of the cabinet. Second, use a simple water ejector which attaches to a water faucet and the water is sucked out of the cabinet. Third, use a portable self-contained pump and motor. The two latter accessories are extra and may be purchased from the firm. Usually the services of a janitor are required to empty the melted ice water and recharge the cooler with ice. By far the most convenient method is to allow the cooler to stand in a permanent place and have a regular floor drain installed.

In a Council test carried out in a room of 2,200 cubic feet, the maximum outside temperature for that day being 90 F., it was found that the temperature in the room after the machine had been in operation for three hours was 77 F. The temperature in the adjoining room at the same time was 85 F. The relative humidity in the adjoining room was about 65 and in the room being cooled about 55. There was 30 square feet of window surface, south exposure. All the rooms surrounding it were not cooled. The occupant of the room stated that he was comfortable while the machine was in operation. There was a marked difference between the temperature in the adjoining room and in the experimental room.

The unit did not cool another room with about 3,344 cubic feet capacity and bad sun exposure, 60 square feet of window surface facing west and the room next to a flat tar paper roof. The company claims that two units would have been required for this room.

The manufacturer believes that the Carrier Portable Room Cooler will serve a therapeutic purpose in a "hospital operating room or dispensary" and that it will "provide comfort in a small individual patient's room either in a hospital or private home."

The Council declares the Carrier Portable Room Cooler eligible for inclusion in its list of accepted devices.

## EMERSON DIAPHRAGM RESPIRATOR ACCEPTANCE

The Emerson respirator is an apparatus for producing prolonged artificial respiration and is manufactured by J. H. Emerson, 15 Brattle Street, Cambridge, Mass.

The machine is driven by an alternating or a direct current motor but may be operated by hand, if for any reason, such as failure of the current, this should be desired.

The body of the machine is a welded steel cylinder. Four windows made of cellulose acetate, "noninflammable" celluloid, are placed at advantageous points for observing the patient. Five portholes are located below the level of the windows for convenient care of the patient. These are provided with sponge rubber diaphragms, permitting the attendant's arms to be inserted into the respirator without interrupting its action.

Emerson respirator.

Sponge rubber collars supplied with the respirator are thick and flexible, and, according to the manufacturer, are comfortable for the patient. The respirator bed may be raised or lowered to center the patient's neck in the rubber collar. The bed, equipped with a sponge rubber mattress, is flat at all times.

A simple adjustment makes it possible to use either positive and negative pressure or negative pressure alone. The respirator is provided with a low pressure dial gage especially developed for this purpose.

Printed instructions for use and care of the machine are permanently placed in plain view on the side of each respirator.

Variations in pressure within the cylinder are produced by a double, heavy leather diaphragm. This diaphragm may be easily replaced if necessary. The mechanism activating the diaphragm is a standard worm reduction unit operated by a one-fourth horsepower electric motor. An adjustment is provided to vary the respiration rate anywhere between 15 and 35 respirations per minute.

Variation in speed is obtained by moving the motor nearer or farther away from a variable speed pulley; as the motor is drawn away from the pulley, the rubber V belt is pulled down closer to the center of the driven pulley, making it go faster. This variable speed pulley is attached to the shaft of a worm reduction unit (50 to 1), equipped with tapered roller bearings on both shafts. The worm reduction unit in turn drives a walking beam, which pushes the leather diaphragm in and out to create the variations of pressure inside the tank.

Moving parts are in plain view and accessible for care and oiling, and it is claimed that the operation is so simple that any hospital electrician or engineer should be able to understand and care for it.

Furthermore, the firm manufactures an infant model. The infant model is similar in operation to the adult respirator, including the hand operation feature and a small size dial pressure gage.

Additional attachments by the manufacturer have been developed for the adult respirator. An attachment can be supplied to raise the foot end of the respirator a maximum of 30 inches off the floor, giving a substantial tilt to the machine.

Another attachment can be fitted on the head end of the machine for continuing artificial respiration when the main body is opened. This attachment is operated by the respirator motor and therefore the respiration rate of the attachment synchronizes with that of the respirator.

The Council on Physical Therapy declares the Emerson Diaphragm Respirator acceptable for inclusion in the Council's list of acceptable devices.

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# Council on Pharmacy and Chemistry

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

**HALIVER OIL WITH VIOSTEROL 250 D-ABBOTT.**—Halibut Liver Oil with Viosterol 250 D-Abbott.—Halibut liver oil, adjusted by addition of maize oil to have a vitamin A potency of not less than 30,000 pharmacopeial units (U. S. P. X) per gram, and by addition of a sufficient amount of viosterol in oil 250 D to assure a vitamin D potency of not less than 250 D [250 times that of the standard cod liver oil defined by the Wisconsin Alumni Research Foundation (or 3,333 units [Steenbock] per gram)].

*Actions and Uses.*—The same as those of cod liver oil (See general article, Cod Liver Oil and Cod Liver Oil Preparations, New and Nonofficial Remedies, 1932, p. 271).

*Dosage.*—For infants, 8 to 10 drops (3 to 3.5 minims) daily; for premature and rapidly growing infants, 15 drops (5.25 minims) daily; for older children, 15 to 20 drops (5.25 to 7 minims) daily; for adults, especially nursing and expectant mothers, 20 drops (7 minims) or more daily. The marketed preparation is accompanied by a special dropper designed to deliver approximately 3 drops to the minim.

Manufactured by the Abbott Laboratories, North Chicago, Ill. U. S. patent and trademark applied for. The viosterol in oil 250 D used is manufactured under U. S. patent 1,680,818 (Aug. 14, 1928; expires 1945) by license of the Wisconsin Alumni Research Foundation.

*Soluble Gelatin Capsules Haliver Oil with Viosterol 250 D-Abbott, 3 minims:* Each capsule contains 3 minims of haliver oil with viosterol 250 D diluted with 3 minims of vegetable oil.

Haliver oil with viosterol 250 D-Abbott is prepared by combining halibut liver oil, maize oil and viosterol in oil 250 D in such proportions that the finished product will have a vitamin A potency of not less than 30,000 pharmacopeial units (U. S. P. X.) per gram, and a vitamin D potency of not less than 3,333 units (Steenbock) per gram. The halibut liver oil is assayed for vitamin A by the method described in the *Journal of the American Pharmaceutical Association* **19:** 616, 1930, and for vitamin D by the method of the Wisconsin Alumni Research Foundation (see under Viosterol, N. N. R., 1932, p. 424). The potency of the finished product is arrived at by a calculated dilution of the previously assayed oil, though some batches are biologically assayed.

**PARKE-DAVIS HALIVER OIL WITH VIOSTEROL-250 D.**—Halibut Liver Oil with Viosterol 250 D.—Halibut liver oil, adjusted by addition of maize oil to have a vitamin A potency of not less than 30,000 pharmacopeial units (U. S. P. X) per gram and by addition of a sufficient amount of viosterol in oil 250 D to assure a vitamin D potency of not less than 250 D [250 times that of the standard cod liver oil defined by the Wisconsin Alumni Research Foundation (or 3,333 units [Steenbock] per gram)].

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Manufactured by Parke, Davis & Company, Detroit. U. S. patent and trademark applied for. The viosterol in oil 250 D used is manufactured under U. S. patent 1,680,818 (Aug. 14, 1928; expires 1945) by license of the Wisconsin Alumni Research Foundation.

*Soluble Gelatin Capsules Parke-Davis Haliver Oil with Viosterol-250 D 3 minims:* Each capsule contains 3 minims of haliver oil with viosterol-250 D, diluted with 3 minims of vegetable oil.

Parke-Davis haliver oil with viosterol 250 D is prepared by combining halibut liver oil, maize oil and viosterol in oil 250 D in such proportions that the finished product will have a vitamin A potency of not less than 30,000 pharmacopeial units (U. S. P. X.) per gram, and a vitamin D potency of not less than 3,333 units (Steenbock) per gram. The halibut liver oil is assayed for vitamin A by the method described in the *Journal of the American Pharmaceutical Association* **19:** 616, 1930, and for vitamin D by the method of the Wisconsin Alumni Research Foundation (see under Viosterol, N. N. R., 1932, p. 424). The potency of the finished product is arrived at by a calculated dilution of the previously assayed oil. Stability tests thus far reported indicate that the product will retain its potency when not exposed to extremes of light or of temperature.

**NORMAL HORSE SERUM** (See New and Nonofficial Remedies, 1932, p. 357).

The Cutter Laboratory, Berkeley, Calif.

*Normal Serum (From the Horse).* (See New and Nonofficial Remedies, 1932, p. 358).—Also marketed in bottles containing 100 cc.

Lederle Laboratories, Inc., Pearl River, New York.

*Normal Horse Serum.* (See New and Nonofficial Remedies, 1932, p. 358).—Also marketed in 30 cc. vial packages.

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# Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

## HEINZ TOMATO JUICE
### (Seasoned with Salt)

*Manufacturer.*—H. J. Heinz Company, Pittsburgh.

*Description.*—Pasteurized tomato juice with added salt; retains in high degree the vitamin content of the raw juice; packed in tins and bottles.

*Manufacture.*—Only the highest quality, carefully selected, vine ripened tomatoes are used; overripe or decayed fruit is rejected. The tomatoes are usually received at the factory within a few hours from the time of removal from the vine; they are thoroughly washed, selected, scalded with steam, trimmed of cores, underripe spots or other unsuitable material, and while still hot are passed to special pressure extractors in which the juice and more tender pulp are pressed out without the incorporation of air. This operation and all subsequent handling of the juice is carried out with as little exposure to air as possible. The juice is heated to 87 C.; a small amount of salt is added; it is filled into tins or bottles, which are sealed and processed at 87 C. for twenty minutes.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 93.3 |
| Total solids | 6.7 |
| Ash | 0.9 |
| Salt (NaCl) | 0.5 |
| Fat (ether extract) | 0.1 |
| Protein (N × 6.25) | 1.0 |
| Crude fiber | 0.3 |
| Carbohydrates other than crude fiber (by difference) | 4.4 |

*Calories.*—0.2 per gram; 6 per ounce.

*Vitamins.*—Biologic assay proves the product to retain in high degree the vitamin content of the raw tomato juice. The vitamin A content is more than 10 per cent of that of butter. Ten grams per day provides adequate vitamin B for normal

growth of rats; 3 cc. of juice affords protection against scurvy in guinea-pigs, which is only slightly more than the quantity of orange juice required. Vitamin G is present in small amount.

*Claims of Manufacturer.*—This tomato juice is a good source of vitamins A and B and an excellent source of vitamin C. Especially prepared for table use and as a vitamin C supplementary food for infant feeding.

## PURITY MILK BREAD

*Manufacturer.*—Purity Baking Company, Decatur, Ill.

*Description.*—A white milk bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from patent flour, water, powdered skim milk, sugar, butter (sweet unsalted), salt, yeast, malt syrup and a yeast food containing calcium sulphate, ammonium chloride, potassium bromate and sodium chloride.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture (entire loaf) | 37.6 |
| Ash | 1.9 |
| Fat | 2.7 |
| Protein (N × 6.25) | 9.9 |
| Crude fiber | 0.3 |
| Carbohydrates other than crude fiber (by difference) | 47.6 |

*Calories.*—2.5 per gram; 71 per ounce.

*Claims of Manufacturer.*—A milk bread of good quality.

## DICKINSON'S LITTLE BUSTER HULLESS POP CORN

*Manufacturer.*—The Albert Dickinson Company, Chicago and Minneapolis.

*Description.*—Canned popcorn kernels with a proper moisture content for popping.

*Manufacture.*—Dwarf hullless variety of popcorn is raised under much the same conditions as is ordinary corn. The corn cobs with the husk partially removed are stored in outdoor specially constructed cribs for drying or "curing." The moisture content of the popcorn as it comes from the fields ranges from 16 to 21 per cent. The corn is air-dried until it assumes an average content of 12 per cent moisture. This natural curing requires from six to eight months, depending on the original moisture content and the weather conditions. The popping condition of the corn is determined by popping tests in which the increase in volume is carefully measured. The properly cured popcorn is shelled from the cob, cleaned by screening and winnowing to remove broken and imperfect grains and chaff, and automatically packed in hermetically sealed tins to preserve the popping quality.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 11.6 |
| Ash | 1.3 |
| Fat (ether extraction method) | 4.9 |
| Protein (N × 6.25) | 12.3 |
| Crude fiber | 3.0 |
| Carbohydrates other than crude fiber (by difference) | 66.9 |

*Calories.*—3.6 per gram; 102 per ounce.

*Claims of Manufacturer.*—Canned dwarf variety popcorn, guaranteed to pop.

## GORMAN'S WHEAT BREAD

(66⅔ Whole Wheat Flour, 33⅓ White Flour)

*Manufacturer.*—Gorman's Bakery, Incorporated, Central Falls, R. I.

*Description.*—A whole wheat and white flour bread made by the straight dough method (method described in THE JOURNAL, March 12, 1932, p. 889); prepared from whole wheat flour, patent flour, water, sweetened condensed skim milk, sucrose, lard, yeast and salt.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture (entire loaf) | 36.7 |
| Ash | 2.1 |
| Fat | 3.7 |
| Protein (N × 6.25) | 11.1 |
| Crude fiber | 1.4 |
| Carbohydrates other than crude fiber (by difference) | 45.0 |

*Calories.*—2.6 per gram; 74 per ounce.

*Claims of Manufacturer.*—This bread supplies cellulose bulk to the diet as an aid to dietary laxation or regulation.

## FISHER'S BLEND BRAND FLOUR (BLEACHED)

*Manufacturer.*—Fisher Flouring Mills Company, Seattle.

*Description.*—An "all purpose" short patent flour prepared from red and white wheats; bleached.

*Manufacture.*—Selected red and white wheats are cleaned, scoured, tempered and milled by essentially the same procedure as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended, bleached with nitrogen peroxide and a mixture of benzoyl peroxide and calcium phosphate (1 pound to thirty-five barrels) and automatically packed in cotton sacks.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 13.2 |
| Ash | 0.39 |
| Fat | 1.0 |
| Protein (N × 5.7) | 11.4 |
| Crude fiber | 0.2 |
| Carbohydrates other than crude fiber (by difference) | 73.8 |

*Calories.*—3.5 per gram; 99 per ounce.

*Claims of Manufacturer.*—An "all purpose" short patent flour for general baking uses.

## STORCK'S BREAD

*Manufacturer.*—Storck Baking Company, Parkersburg, W. Va.

*Description.*—A white bread made by the sponge dough method (as described in THE JOURNAL, March 5, 1932, p. 817); prepared from patent flour, water, dry skim milk, sucrose, salt, yeast, lard, malt syrup, and yeast foods containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, and a mixture of calcium acid phosphate and calcium peroxide.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture (entire loaf) | 34.0 |
| Ash | 1.5 |
| Fat | 1.4 |
| Protein (N × 6.25) | 10.2 |
| Crude fiber | 0.2 |
| Carbohydrates other than crude fiber (by difference) | 52.7 |

*Calories.*—2.6 per gram; 74 per ounce.

*Claims of Manufacturer.*—A bread of good quality.

## PURE CALIFORNIA EHMANN OLIVE OIL PURE EHMANN OLIVE OIL

*Manufacturer.*—Ehmann Olive Company, Oroville, Calif.

*Description.*—Cold-pressed, unblended, olive oil.

*Manufacture.*—Mature California olives are harvested and delivered direct to the mill. Care is taken to prevent heating or molding through improper stacking of boxes of olives. The fruit is ground and pressed in hydraulic presses, which are adjusted so that the pit is not crushed. The expressed liquid is allowed to stand in settling tanks to permit separation of the oil, which is skimmed off, stored in tanks for several weeks and double filtered by gravity (a force filter or filter press is not used). The filtered oil is aged for at least six months and packed in bottles and tins. The oil is guaranteed not to contain in excess of 0.2 per cent free fatty acid as oleic acid.

*Analysis* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 0.0 |
| Fat (ether extract) | 100.0 |
| Free fatty acids (as oleic acid) | 0.2 |
| Specific gravity (15.6 C./15.6 C.) | 0.915 |
| Refractive index at 15.5 C. | 1.4712 |
| Iodine number (Hanus) | 85. |
| Saponification number | 190. |
| Unsaponifiable matter | 1.4 |

*Calories.*—9.0 per gram; 255 per ounce.

*Claims of Manufacturer.*—A pure cold-pressed virgin olive oil for table and medicinal use.

## WEIDEMAN BOY BRAND TOMATO JUICE

*Manufacturer.*—The Loudon Packing Company, Terre Haute, Ind.

*Description.*—This product is the same as Loudon Brand Tomato Juice (THE JOURNAL, June 25, 1932, p. 2289).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 17, 1932

## THE NATURE OF PROTEIN SOLUTIONS

The question of the nature of protein solutions has disturbed workers in the field for many years. On the one hand are the views advocated by such colloid chemists as Wolfgang Ostwald that the proteins are to be considered primarily as colloids and as such are incapable of forming true chemical combinations with other substances. Opposed to this view are the conceptions of such biologic chemists as Sørensen, Michaelis and Pauli, who consider the proteins primarily as amphoteric electrolytes, which, however, are unique in that they also exhibit certain colloidal properties because of their enormous molecular size. Recent investigations of these substances, carried out largely under the direction of Prof. S. P. L. Sørensen in the Carlsberg Laboratories, in Copenhagen, have led to conceptions of the nature of protein solutions which are bound to find important application in our ideas concerning the behavior and the function of the proteins in protoplasm. These investigations have been ably discussed and summarized in a recent publication by Sørensen.[1]

Studies of the behavior of the serum globulins led Sørensen, some years ago, to conclude that euglobulin and pseudoglobulin were reversibly combined in a loose chemical combination, $E_pP_q$, in which E and P represent euglobulin and pseudoglobulin complexes, respectively, combined in the relative proportions of p and q. Subjecting serum to such procedures as dialysis, or addition of ammonium sulphate, results in a shifting of the proportions of E and P with the resultant formation of less soluble and more soluble complexes of the two proteins. Sørensen failed to prepare, even after repeated fractionations, samples of either euglobulin or pseudoglobulin that were completely free from the other protein. These results with the globulins led to a series of investigations of other proteins with the result that apparently pure preparations of serum albumin, casein and gliadin were each found to consist of mixtures of an unknown number of proteins of similar character combined in a reversible manner. Such proteins, according to Sørensen, represent "reversibly dissociable component systems" and may be represented by the formula $A_xB_yC_z$ . . ., in which A, B, C and so on represent components of a definite character and composition (e. g., polypeptides) and x, y, z and so on indicate the number of such components in the complex system. In each component, atoms or groups of atoms, such as amino-acids, are linked together by means of strong chemical bonds, whereas the complexes are formed by the union of many components through weak, residual valences. Chemical or physical agents that act on the chemical bonds produce irreversible changes in the protein molecule, whereas the residual valences readily respond to changes in salt concentration, $p_H$ or temperature, in a reversible manner. Although the fractions obtained by the various fractionation methods employed possess the essential properties of the initial material, they exhibit variations in physical properties and chemical composition that are best considered as being due to the varying amounts of the individual components in each fraction. In no case thus far studied has Sørensen succeeded in isolating a component capable of resisting further fractionation by appropriate methods.

In biologic fluids, these simple protein complexes combine, by means of their residual valences, not only with complexes of the same kind but also with other complexes present in the system. In serum, for example, are probably found not only those systems, such as albumins and globulins, which may be isolated by suitable precipitation methods, but also mixed systems containing both of these substances combined in varying proportions not only with each other but with other serum constituents, such as the lipids.

These conceptions of Sørensen account for the extraordinary difficulties encountered in the isolation of reproducible protein systems from such complex biologic fluids as serum or egg white. They also serve to explain results obtained by Svedberg[2] and his collaborators, using entirely different experimental methods. Svedberg finds, for example, that there is no substance in fresh egg white with a molecular weight which corresponds to that of crystallized ovalbumin, but that this substance appears only after the egg white is treated with ammonium sulphate, as in the crystallization process. Similarly, a protein with the molecular weight of lactalbumin appears in milk only after treatment with ammonium sulphate. In the case of serum, Svedberg finds that half saturation with ammonium sulphate precipitates globulin having a definite molecular weight and that the euglobulin and pseudoglobulin appear when this substance is subjected to further fractionation processes. These results of Svedberg, when interpreted in accordance with the

1. Sørensen, S. P. L.: The Constitution of Soluble Proteins (Reversibly Dissociable Component Systems), Compt. rend. trav. Lab. Carlsberg **18**, No. 5, 1930.

2. Svedberg, T.: Molecular Weights of the Proteins in Their Native State, Nature **128**: 999 (Dec. 12) 1931.

conceptions of Sørensen, indicate that the simple proteins with which we are familiar exist in nature only as part of more complex systems. The difficulties of the protein chemist are increased enormously for, in addition to extracting from complex biologic mixtures, by standardized methods, component systems that are reproducible, it now becomes essential to develop methods for the separation of these systems into their individual components. The determination of the nature of these comparatively simple components must await further progress in this important field.

There still remains to be pointed out some of the effects which these new conceptions of the nature of protein solutions must have on the interpretation of laboratory work involving the proteins and, more generally, on one's picture of the part these substances play in protoplasm. Such determinations as albumin-globulin ratios, for example, are probably dependent largely on the nature of the complexes present in the serum and must be considered from this point of view. In protoplasm, instead of relatively inert, independent, colloidal particles, there are probably complex systems in equilibrium with one another and constantly shifting in response to changes in environment. The multiplicity and flexibility of these systems are probably of profound importance in determining the adaptability of the organism to its environment.

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## CORRELATION OF BLOOD DYSCRASIAS ON HYPOTHESIS OF BONE MARROW DEFICIENCY

New data concerning the blood and blood forming organs has given renewed impetus to progress in hematology. As a result of the development of much material, classification of separate syndromes is being attempted on the basis of causative factors and pathogenesis. Unfortunately, the etiology of most blood dyscrasias is not definitely known. The recent tendency of those interested in clinical hematology is to focus attention on the pathology of the blood forming organs. This fundamental approach yields valuable information. Moreover, in recent discussions on hematology there has been a tendency to substitute rigid systems of classification for rational descriptive analyses of each dysfunction.

Lescher and Hubble[1] have attempted to correlate disorders of the bone marrow with a group of conditions in which the blood elements are deficient. These include agranulocytic angina, idiopathic purpura hemorrhagica, pure red cell anemia and idiopathic aplastic anemia. They propose a nomenclature to emphasize the common pathogenesis of aplasia or hypoplasia of bone marrow deficiences. Aplastic anemia, in which all three elements are deficiently produced, should be known as myelophthisis; agranulocytic angina, in which there is defective formation of granulocytes, as granulophthisis; the rare cases of pure red cell anemia, as erythrophthisis; and one group of purpura hemorrhagica as thrombophthisis. It is their opinion that this nomenclature emphasizes the connection between these disorders and indicates their origin as bone marrow deficiencies. As the authors point out, these diseases are of fundamental importance because they compel consideration of the bone marrow function and the factors that normally stimulate and inhibit the production of blood elements. Such a conception also has virtue in emphasizing a difference in prognosis when the clinical picture may be indistinguishable.

Although Lescher and Hubble present an excellent critical review of various theories of the pathogenesis of these disorders, it is questionable whether enough that is definite has been developed to justify the use of the proposed nomenclature. Conclusive evidence is not presented that the changes in the bone marrow are as clear cut as they indicate. In the cases of agranulocytosis that Schultz first reported, involvement was not noted in the erythropoietic or megakaryocytic elements. Subsequent case reports by other observers, however, indicated that the pathologic changes in the bone marrow were not so sharply defined in all cases and that anemia and hemorrhage may sometimes be present. Variation in the clinical picture and response to therapy have also been noted. Neither is it established that any group of idiopathic purpura hemorrhagica can be attributed solely to deficient production of platelets by the bone marrow. In some cases megakaryocytes are reported as actually increased in the bone marrow; in others they are morphologically and functionally changed and in another group they are reduced. It has not been possible to separate these cases on the basis of clinical and pathologic observations. The authors suggest that thrombopenic purpura may eventually be divided into two or more groups in which there is (1) a deficient production of megakaryocytes or (2) a defective separation of the platelets from the megakaryocyte. If platelet production alone is involved in the pathogenesis of idiopathic purpura hemorrhagica, it is difficult to understand why patients who undergo splenectomy eventually have a low platelet count but are free from purpura. An improved functional capacity of platelets after splenectomy, which might be used as an explanation, has never been adequately demonstrated except by inference. The authors review the various objections to attributing hemorrhage solely to platelet reduction and consider the part which pathologic changes of the capillaries may play in the production of symptoms. They apparently feel, nevertheless, that there is one group of idiopathic purpura hemorrhagica which may develop solely on the basis of deficient platelet production.

The disorders enumerated are striking examples of the impossibility of defining clearly any disorder of

1. Lescher, F. G., and Hubble, Douglas: A Correlation of Certain Blood Diseases on the Hypothesis of Bone Marrow Deficiency or Hypoplasia, Quart. J. Med., July, 1932.

which the etiology is unknown. Indeed, it is difficult to arrange isolated observations regarding the disease in any orderly sequence without the proper conception of cause and effect. While it is of value to examine data critically from time to time as the authors have done, it is apparent that the time is not yet ripe for a correlation of a group of disorders of the blood and blood forming organs whose pathogenesis is still in doubt. Such premature correlation minimizes the divergent features which demand study and may serve to inhibit or to give a wrong trend to rational therapy.

### "VIRULENCE CYCLE" IN EPIDEMICS

Ancient clinicians used to feel that the demon responsible for a specific epidemic hibernated in the underworld. Then, emaciated and ravenous, it fought its way past the holy ramparts into the city, where it fed first on defenseless infants, later on the stronger adults. Finally, satiated, it lost its lust for human flesh and retired for another hibernation. Modern clinicians consider this merely a fantastic explanation of the observed course of epidemics. However, L. T. Webster [1] asserts that many of our current epidemiologic theories are nothing more than thinly disguised paraphrases of this ancient demonic metaphor.

Bacteriologists of the Pasteur-Koch era intuitively translated many ancient traditions into the newly developed language. They assumed, for example, and apparently without realizing the necessity of experimental proof, that specific infectious agents are always introduced into a community in an attenuated form and are subsequently increased in virulence or infectivity by successive human passage. After the "peak" of the resulting epidemic, the virulence was assumed to lessen, presumably as a result of microbic conflict with the resistant population. With a final almost total loss of virulence, the epidemic ceased.

This virulence cycle found some support in the increased infectivity of old test-tube cultures on successive animal passage, and in the usual initial low virulence of certain natural viruses when transferred to another animal species. Recognizing the inadequacy of such evidence, however, Webster and his colleagues made careful comparisons of the virulence of the specific causative agents in the various stages of their experimentally produced epidemics, all tests being made in the same animal species. To their surprise they found that in their carefully quarantined mouse and rabbit populations the virulence of the specific causative agents remained practically unchanged throughout all epidemics. "In no instance were significant differences in the virulence of preepidemic, epidemic and postepidemic strains detected. . . . Strains from fatal cases proved to be of the same virulence as similar strains from healthy carriers." Bacterial dissociation and bacteriophage phenomena, although abundantly present, seemed to play no part in altering virulence, or in otherwise limiting the spread of infections. The Rockefeller Institute workers, of course, did not generalize from these observations that virulence changes may not play a part under other experimental conditions. Their results, however, have definitely shifted the burden of proof to clinicians who champion the conception of "virulence cycles" in epidemics.

Webster and his co-workers emphasize the importance of the initial dose of specific infectious agents in relation to the general resistance of a population. The reduction of general resistance, for example, by the introduction of low resistant immigrants was sufficient to cause a latent epidemic manifest only by subclinical cases or carrier states to flare up into a devastating pestilence. Depression of general herd resistance by climatic conditions or by dietary deficiencies caused similar explosive outbreaks. Optimal diets or dietary reinforcements with butter fat or cod liver oil tended to prevent or at least lessen herd mortality.

It was an essential part of the Rockefeller Institute technic to produce herd epidemics through natural portals of infection. Their results, therefore, seem to represent complete immunologic pictures including the combined results of portal defenses and internal protective factors.

1. Webster, L. T.: Experimental Epidemiology, Science **75**: 445 (April 29) 1932. A bibliography is given by Topley, W. W. C., and Wilson, G. S.: The Principles of Bacteriology and Immunity, 1929, vol II, chap. liv, pp. 767-786.

## *Current Comment*

### THE CONTENT OF CHOLESTEROL IN THE BLOOD

A fundamental feature in the application of various chemical "constants" of the fluids of the body to the needs of clinical diagnosis lies in the dependability of the data that are employed. Departure from the "normal" figures can then be utilized for conjectures as to the existence of abnormal conditions. Thus, it is essential to know definitely about the variability in the content of the blood sugar during health and under customary changes in routine and regimen, before a proper interpretation can be given to analytic results that deviate from "average" records. There are diurnal variations in body temperature that must not be mistaken for indications of ill health. For many body "constants" the permitted range of variation that is physiologic has been well established. Much remains to be accurately ascertained. During recent years attention has been focused by many clinicians on the cholesterol content of the blood. There have been numerous reports of deviations from the normal with attempts to associate them with special types of disease. One may almost say that a cholesterol cult has arisen even before the physiologic rôle of this unique lipid has been established. How much remains to be done before any well established norms are available has been indicated

by recent studies of Bruger and Somach [1] at the New York Post-Graduate Medical School. They show that the cholesterol content of the blood examined under strictly comparable laboratory conditions—an important detail—is by no means constant from hour to hour, even in the fasting state. In fact, healthy persons may show practically the same degree of variation as is found in the blood in pathologic states. Contrary to what many have been led to expect, the ingestion of food is reported to have no appreciable effect, either immediate or late, on the cholesterol content of the blood. In general the figures are lower in the morning; hence it is suggested that cholesterol studies be carried out then. For the present one is forced to concede that normal persons may undergo variations in the content of blood cholesterol which are of the same magnitude as those found in pathologic states. According to Bruger and Somach, this statement must be modified only for those clinical conditions which accompany severe cachexia or apply to patients at the point of death.

# Association News

## MEDICAL BROADCAST FOR THE WEEK

### American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 10:45 to 10:50 a. m. over Station WBBM (770 kilocycles, or 389.4 meters). The Columbia chain program has been discontinued for the present.

The subjects for the week are as follows:

September 19. And Then the Schoolboy.
September 21. The Father of Surgery.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 10:45 to 11 over Station WBBM.

The subject for the week is as follows:

September 24. Obesity.

This schedule is based on Chicago daylight saving time, one hour faster than central standard time.

## QUARTERLY CUMULATIVE INDEX MEDICUS

Volume 11, 1932, of the *Quarterly Cumulative Index Medicus* has just appeared. It represents the first issue since this publication was taken over completely by the American Medical Association. The book is published at considerable loss and represents a contribution by the American Medical Association to the advancement of medical science. In a desire to make the publication satisfactory to its principal users, a letter was sent early in July to all libraries subscribing to the *Index*, asking the opinion of librarians as to the desirability of publishing a special edition of the *Index* on 100 per cent rag paper so as to give it permanence. Three hundred and eighty-four letters were sent to domestic, foreign and Canadian librarians, and approximately 50 per cent of the librarians addressed have replied up to this time. Approximately 6 per cent of the librarians indicate a desire for a special edition and a willingness to pay for such a special edition at an advanced rate.

With the issuing of the present volume, arrangements have been made to improve the binding greatly without, however, increasing the cost of the *Index*. The binding now used has greater strength and durability than the one formerly used.

Because of the relatively small number of librarians indicating willingness to subscribe to the rag paper edition, it has been decided not to issue the *Index* in this form.

1. Bruger, M., and Somach, I.: The Diurnal Variations of the Cholesterol Content of the Blood, J. Biol. Chem. 97: 23 (July) 1932.

The majority of letters received from librarians contain high praise for the *Index* as produced and commendation for the Association in publication of this work. One librarian writes, "Just as the sterilizer is the center of the hospital so is the *Quarterly Cumulative Index Medicus* the center around which the medical library revolves."

The letters from the librarians also indicate that most medical libraries are at this time undergoing great financial strain and relatively little expansion.

# Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

## CALIFORNIA

**University News.**—The Rockefeller Foundation recently made available to Stanford University a gift of $200,000 to promote research in the social sciences. This research has been supported for a number of years by the Laura Spelman Rockefeller Memorial Fund. Seventy-five thousand dollars of the total, which is to be distributed over a five year period, is unconditional. The remainder will be granted on the condition that the university provide an equal amount from other sources.

**Campaign to Enforce Egg Standardization.**—The August 27 issue of the bulletin of the state department of health notes that city and county health officers of California are assisting in a campaign to enforce the law pertaining to the standardization of eggs. One hundred thousand copies of an explanatory digest of the law have been distributed. The law is designed to establish standards by which the consumer can purchase eggs and be certain of their quality and size. The educational campaign was begun by the food and drug enforcement division of the state health department.

**Change in Military Instructors.**—As a result of the economy bill passed by the last congress, Col. William A. Powell, professor of medicomilitary science and tactics, University of California Medical School, has been relieved of his duties after eight years' service. Col. Cosam J. Bartlett, U. S. Army Medical Corps, stationed at the Presidio, has been placed in charge of medicomilitary science and tactics at the medical school to see that those students already started in the curriculum are allowed to complete it. As soon as the present medical students are graduated, the subject will be discontinued, unless national finances improve in the meantime.

## GEORGIA

**Society News.**—Dr. Charles Usher, Savannah, among others, addressed the First District Medical Society, August 3, on "Massive Collapse of the Lung," and Dr. John William Shearouse, Savannah, "Transurethral Prostatectomy."——Dr. Benjamin H. Minchew, Waycross, addressed the Ware County Medical Society, August 5, on "Physiology of Squint."——The Twelfth District Medical Society, at its meeting in Vidalia, July 7, was addressed, among others, by Dr. Cleveland Thompson, Millen, on "Practical Treatment of the Common Neuroses."——At a meeting of the Randolph County Medical Society in Cuthbert, August 3, N. Meredith DeJarnette, Atlanta, spoke on "Arsphenamine Poisoning."——Speakers before the Muscogee County Medical Society, August 11, were Drs. Otis D. Gilliam and James H. McDuffie, Jr., both of Columbus, on ruptured appendix and amenorrhea, respectively.——Dr. Allen R. Rozar, Macon, discussed "Fractures in and Around the Elbow" before the Macon County Medical Society, August 2.

## ILLINOIS

**Society News.**—The Massac County Medical Association was host to the fifth quarterly meeting of the Southwestern Kentucky Medical Society in Metropolis, August 23. Speakers were Drs. Charles E. Gilliland and Paul B. Nussbaum, St. Louis, on newer aspects of pancreatic diseases and cancer, respectively.——The St. Clair County Medical Society was addressed, September 7, by Dr. Joseph P. Costello, St. Louis, on "Common Disorders of Childhood." Dr. Daniel L. Sexton,

St. Louis, addressed the society, September 1, on "Practical Value of Present-Day Endocrine Therapy."——Dr. Philip H. Kreuscher, Chicago, addressed the Fulton County Medical Society, August 24, on "Fractures of the Elbow and Hip."——Dr. William H. Olmsted, St. Louis, addressed the Madison County Medical Society, September 2, on "Arteriosclerosis of the Lower Extremities with Particular Reference to the Treatment of Diabetic Gangrene."——Dr. Henry E. Monroe, Shelbyville, spoke on appendicitis before the Shelby County Medical Society at Lithia Springs, recently.

**Children's Clinics in Physicians' Offices.**—School children of Springfield will receive free physical examinations and those unable to pay will be given treatment without charge, according to a plan adopted by the Sangamon County Medical Society, September 1. Vaccinations against smallpox and immunizations against diphtheria will be provided at reduced rates for families in moderate circumstances. The program was sponsored by Dr. Gottfried Koehler, who was recently appointed director of health and hygiene of Springfield schools, a position created with a view to instituting better health supervision in the schools. According to the plan, every doctor in the society will conduct a children's clinic in his office during one office period each week. The school health service will refer all cases to the family physician. The Sangamon-Menard-Logan County Dental Society is planning to adopt a similar program, it was reported. The dental examinations will be conducted at the schools instead of in the dentist's office. The plan will prevail only during the current economic depression.

### Chicago

**Dr. Curtis Goes to Ohio University.**—Dr. George M. Curtis has resigned as professor of surgery in the Graduate School, Division of Biological Sciences, University of Chicago, to accept a similar position at Ohio State University College of Medicine, Columbus. Dr. Curtis became associated with the university in 1925, when he was appointed associate professor of surgery and associate professor of experimental surgery under the Douglas Smith Foundation for Medical Research at the institution. He will assume his new position at once.

**Child Guidance Work.**—Dr. Herbert E. Chamberlain has been appointed associate professor of psychiatry in the department of pediatrics, Division of Biological Sciences, University of Chicago. In this capacity he will assist in a study of delinquent children in Chicago. Medical cooperation covering the entire field of pediatrics will be provided for the study and it is planned to establish an adequate child guidance clinic to which children in need of psychiatric advice and treatment may be referred. While this clinic is being established to assist in this social service study, it is understood that patients from other sources will be accepted, particularly those referred by physicians in the department of pediatrics. It will be administered as a regularly constituted clinic under the jurisdiction of the department of pediatrics. Dr. Chamberlain recently resigned as director of the child guidance clinic of the board of education at Minneapolis.

## INDIANA

**License Reinstated.**—At a meeting of the state board of medical examiners, July 14, the license of Dr. Pierre Lafayette Stewart, formerly of Fort Wayne, was reinstated on his "showing that he will engage in reputable practice." Dr. Stewart's license had been revoked, May 19, 1913, for his connection with a medical outfit that advertised.

## IOWA

**Graduate Courses.**—The Speakers' Bureau of the Iowa State Medical Society will begin in Monticello, September 21, a series of graduate courses covering surgery in general practice, obstetrics and pediatrics. The fee is $15 for the combined courses, which will be held on Wednesday nights and run for ten weeks.

## KANSAS

**Personal.**—Dr. Arthur J. Revell, Arma, became health officer of Cherokee County, September 1, succeeding Dr. Clarence R. Hepler, who has accepted a similar position in Sedgwick County.

**The Old Settlers' Parade.**—Dr. Solomon T. Shelly, Mulvane, now 76 years of age, held a reception on the lawn of his home, August 25, for all persons whose birth he attended during the past fifty years, 1,000 of whom attended. Dr. Shelly also rode the same day in the Old Settlers' Parade on a pony, the only means of travel during his first years at Mulvane.

## MAINE

**Health Department Wants Paralysis Serum.**—The state department of health has made public a request for blood of persons who have had infantile paralysis not more than twenty years ago. Five dollars will be paid to each person responding to this appeal. The serum prepared from the blood given in this manner will be made available for all reported cases of infantile paralysis.

## MARYLAND

**Reorganization in Health Department.**—R. S. Craig, director of the bureau of chemistry and food of the Baltimore health department, has been appointed director of the sanitary section, with supervision over all the sanitary activities of the department. This is a new position in accordance with plans for reorganization of the health department. F. A. Korff, now assistant head of the bureau of chemistry and food, will become director of that division. Later on, the announcement stated, the medical activities of the department will be coordinated under one head.

**Reporting Occupational Diseases.**—At a meeting of the state board of health, August 18, the board designated the Baltimore health department as its agent in receiving reports of cases of occupational disease within the city. Reports received by the city health department under the arrangement will be transmitted to the state board of health. The city health department plans to study conditions under which occupational diseases occur, for the purpose of assisting the industries in their prevention. In order to ascertain the extent of the problem, physicians in private practice or in hospital or dispensary service are requested to report industrial cases to the city health department on the postcards furnished for reporting communicable diseases.

**Examination of Baltimore Children.**—During the school year ended July 31, 9,123 children in public and parochial elementary schools in Baltimore were examined under supervision of the Baltimore County Health Department. Of these, 1,488 were underweight or gave other evidence of malnutrition; 7,703 needed dental attention, and 6,877 had infected or enlarged tonsils. Examinations in the public schools were made as a part of the regular activities of the health department, and those in the parochial schools on request. Analysis showed that the percentage of malnutrition was lowest in the first grades and gradually increased grade by grade, up to and including the sixth. Twenty-two child health conferences for the examination of preschool children were held in the county during the year; 722 children were examined. In this group 621 needed dental care; 421 had unfavorable conditions of the nose and throat and ninety-two were underweight. In both groups, 2,780 children were immunized against diphtheria and 998 had corrections made.

## MASSACHUSETTS

**Fall Graduate Courses.**—A course of fifteen lectures and demonstrations on internal medicine for graduates in medicine will be given under the auspices of Harvard University Medical School by Dr. Frederick T. Lord, one each week, beginning September 21 and continuing through December 28. Each exercise will consist of the study of cases and an informal lecture. Subjects to be covered include diseases of the gastrointestinal system, respiratory system, kidneys, blood-forming organs, the circulation, locomotor system, deficiency diseases, heart disease, syphilis, pneumonia, infantile paralysis and tuberculosis. The fee for the course, which will be given at Massachusetts General Hospital, will be $25.

## MICHIGAN

**Society News.**—Dr. Salvatore Lojacono, superintendent of the Morgan Heights Sanatorium, Marquette, was elected president of the Michigan Sanatorium Association at its annual meeting, August 27, and Dr. Roger J. Hanna, Jackson, was elected secretary. The association will hold its next meeting in the Jackson County Sanatorium, Jackson.

**Eyesight Swindlers Foiled.**—That the "eyesight specialists" are again active in Michigan is indicated by a recent newspaper report. According to the account, two men, representing themselves as "eyesight specialists," called at the home of a farmer in Coe township. One conducted the examination, while the other remained outside in a car. After a lengthy examination, one of the children in the family proved to have a "cancer on the eye," according to the report, and the eyesight could be saved only by an operation in an "Eastern clinic." However, the "specialist" suddenly recalled that his waiting

associate had developed a serum which would bring about results similar to those of the operation. The second "specialist" dropped the "serum" into the child's eye and removed a few minutes later what he said was the cancer. One of the men accompanied the farmer to the bank to receive the $875 which was charged for this "operation." However, the cashier regarded the withdrawal as rather large and after being informed of the circumstances called the police. When the police arrived the "specialist" had left to find his associate.

## NEVADA

**Society News.**—Dr. Ralph A. Reynolds, San Francisco, addressed the Washoe County Medical Society, June 14, on recent advances in endocrinology.

**State Medical Meeting at Reno.**—The twenty-ninth annual meeting of the Nevada State Medical Association will be held in Reno, September 23-24, at the Hotel Golden, under the presidency of Dr. Amos C. Olmsted, Wells. Speakers announced in the program are:

Dr. Miley B. Wesson, San Francisco, "Infection in the Genito-Urinary Tract."
Dr. Joseph P. Tuttle, Reno, "Prostatitis and Referred Pain."
Dr. James P. Kerby, Salt Lake City, "Intravenous Pyelography."
Dr. Leo P. Bell, Woodland, Calif., "Results of Operative Procedure on Stomach and Duodenum for Cure of Gastric and Duodenal Ulcers."
Dr. James T. Watkins, San Francisco, "Fractures of the Spine."
Dr. William D. Donoher, Salt Lake City, "Sinus Diseases."
Dr. Charles A. Dukes, Oakland, Calif., "Treatment of So-Called Inoperable or Incurable Cancers."
Dr. Fuller B. Bailey, Salt Lake City, "Functional Diseases of the Intestinal Tract."
Dr. Edgar L. Gilcreest, San Francisco, "Undiagnosed Shoulder Lesions and Injuries."
Dr. Martin A. Robison, Reno, "Anesthetics."

Dr. Olmsted will deliver the presidential address Friday morning at the opening session.

## NEW JERSEY

**New Division of Rockefeller Institute.**—The department of plant pathology of Rockefeller Institute for Medical Research will start work about October 1 in its new laboratory now being completed at Princeton. Louis O. Kunkel, Ph.D., who has been pathologist at the Boyce Thompson Institute for Plant Research at Yonkers, N. Y., since 1923, is to be in charge of the new division (THE JOURNAL, June 20, 1931, p. 2131). The name of the entire Princeton section of the institute has been changed to the Department of Animal and Plant Pathology of the Rockefeller Institute for Medical Research. This is said to be the first time that the pathology of human beings, of plants and of animals has been studied in a single investigative unit.

## NEW YORK

**Personal.**—Dr. Harry C. Hummell has been named deputy health officer of Rochester to succeed Dr. Arthur M. Johnson, who recently became health officer on the retirement of Dr. George W. Goler.

**Hospital Celebration.**—St. Mary's Hospital, Rochester, celebrated its seventy-fifth anniversary, September 8-10. The hospital was opened, Sept. 8, 1857, by three Sisters of Charity. The present building, made necessary by an influx of wounded soldiers, was erected in 1862. In 1891 the interior was destroyed by fire, but it was immediately rebuilt. Since its establishment, the hospital is said to have cared for 137,726 patients, exclusive of outpatients.

### New York City

**Course in Psychoanalysis.**—The New York Psychoanalytic Institute announces a series of ten lectures on psychoanalysis in medicine, to begin October 6 and continue for ten successive Thursdays. The lecturers will be:

Dr. Clarence P. Oberndorf, "History and Scope of Psychoanalysis" and "Psychopathology of Everyday Life—Mental Mechanisms."
Dr. Abraham A. Brill, "Sexual Theory."
Dr. Monroe A. Meyer, "General Theory of the Neuroses."
Dr. Dorian Feigenbaum, "Conversion Hysteria."
Dr. Alexander Sandor Lorand, "Anxiety Hysteria."
Dr. Philip R. Lehrman, "The Compulsion Neurosis."
Dr. Gregory Zilboorg, "Manic-Depressive Psychoses."
Dr. Abraham Kardiner, "Schizophrenic Psychoses."

Registration may be made with Dr. Meyer at the institute, 324 West Eighty-Sixth Street. A fee of $10 will be charged.

**The Fifth Annual Graduate Fortnight.**—Following are the names of the speakers who will address the evening sessions of the Fifth Annual Graduate Fortnight of the New York Academy of Medicine, October 17-28:

Dr. Henry E. Sigerist, Baltimore, "The History of Cancer."
Dr. Francis Carter Wood, New York, "Cancer Research."
Dr. James Ewing, New York, "Factors Constituting Malignancy and Tumors."
Dr. Harrison S. Martland, Newark, N. J., "Consecutive Clinical and Pathological Events in Cancer."
Louis I. Dublin, Ph.D., New York, "Importance of Statistics in Cancer Control."
Dr. Charles A. Elsberg, New York, "Tumors of the Brain."
Dr. Harvey Cushing, Boston, "Tumor of Optic Chiasm and Optic Tract."
Dr. W. Gordon M. Byers, Montreal, Que., "Tumors of the Eye and Orbit."
Dr. Samuel J. Kopetzky, New York, "Cholesteatoma."
Dr. Byron P. Stookey, New York, "Tumors of the Spinal Cord."
Dr. Dean Lewis, Baltimore, "Tumors of the Nerves."
Drs. George J. Heuer and James Alexander Miller, New York, "Tumors of Pleura and Lungs."
Dr. Edwin Beer, New York, "Tumors of the Bladder."
Dr. Joseph F. McCarthy, New York, "Malignancies of the Prostate."
Dr. George Gray Ward, Jr., New York, "Cancer of the Uterus."
Dr. Thomas S. Cullen, Baltimore, "Fibroids and Adenomata."
Dr. Benjamin P. Watson, New York, "Tumors Complicating Pregnancy."
Dr. Donald C. Balfour, Rochester, Minn., "Cancer of the Stomach."
Dr. Daniel F. Jones, Boston, "Tumors of the Colon and Rectum."
Dr. Carl Eggers, New York, "Tumors of the Mouth and Tongue."
Drs. James M. Hitzrot and Ralph E. Herendeen, New York, "Tumors of Bone and Allied Structures."
Dr. Abernathy Benson Cannon, New York, "Tumors of the Skin and Mucous Membrane."
Dr. Lloyd F. Craver, New York, "Hodgkin's Disease and Lymphadenomata."

Afternoon clinical programs will be presented in eighteen leading New York hospitals. Concurrent with the fortnight and for a week thereafter, a scientific exhibit of approximately 3,000 units will be on view at the academy building. Demonstrations will be held at regular intervals in connection with some of these.

## OHIO

**Fifth District Meeting.**—The annual meeting of the Fifth Councilor District of the Ohio State Medical Association was held, September 16, in Cleveland. Four addresses on pulmonary tuberculosis were presented by Cleveland physicians as follows: Drs. Joseph C. Placak, diagnosis; Richard Dexter, diagnostic errors; Raymond C. McKay, medical management; Samuel O. Freedlander, surgical treatment. Drs. Henry J. Gerstenberger and Herbert S. Reichle, Cleveland, presented a paper on tuberculosis in infancy and childhood. Drs. Marion A. Blankenhorn and Robert H. McDonald, Cleveland, spoke on neurologic manifestations and treatment, respectively, of pernicious anemia; Vernon C. Rowland, on anemia of pregnancy, and Roscoe D. Leas, treatment of secondary anemia. At an evening session held in conjunction with the Cleveland Academy of Medicine, Dr. Gerald B. Webb, Colorado Springs, Colo., was the guest speaker, on "Practical Points in the Diagnosis and Therapy of Pulmonary Tuberculosis." Dr. Harry V. Paryzek is councilor for the district.

## PENNSYLVANIA

**Society News.**—The Second Councilor District of the Medical Society of the State of Pennsylvania held a meeting at the Reading Country Club, September 14. Dr. Charles H. Frazier, Philadelphia, spoke on "The Goiter Problem" and Dr. Walter F. Donaldson, Pittsburgh, on "The Renaissance of the Family Doctor." Dr. Charles Falkowsky, Jr., Scranton, president-elect of the state society, and Dr. William H. Mayer, Pittsburgh, president, made addresses, and Dr. Mary E. Lehman, Bristol, presented a brief history of the Bucks County Medical Society.

### Philadelphia

**Personal.**—Dr. Abraham I. Rubenstone has been named medical director of Mount Sinai Hospital to succeed the late Dr. Henry B. Shmookler. Dr. Rubenstone was attending physician at the hospital.

**University News.**—A sixty-bed addition to the building of the department of children's diseases of Temple University School of Medicine has been begun and twelve physicians have been added to the department staff, it was announced, September 2. The new appointees, who will assist Dr. Ralph M. Tyson, recently named professor of pediatrics, are Drs. Henry H. Perlman, William H. Crawford, Edward D. Atlee, James E. Bowman, Scott P. Verrei, Joseph Levitsky, Robert S. Heffner, Paul B. Bender, Charles R. Barr, Vincent T. Curtin, Pascal F. Lucchesi and Samuel Goldberg.

## SOUTH CAROLINA

**Hospital News.**—St. Francis Hospital, formerly the Emma Moss Booth Memorial Hospital, Greenville, was opened for patients, July 18, by the Sisters of St. Francis. The building, which has a capacity of sixty beds, has been remodeled.

**Society News.**—The Abbeville County Medical Society was reorganized, August 12, at a meeting at the Abbeville County

Memorial Hospital. Dr. John V. Tate, Calhoun Falls, was elected president and Dr. Francis L. Mabry, Abbeville, secretary.——Dr. Julius H. Taylor, Columbia, addressed the Columbia Medical Society in July on "Treatment of Varicose Veins by the Injection Method."——Dr. Lawrence H. McCalla, Greenville, spoke on varicose veins and Dr. Richard M. Pollitzer, Greenville, on "Pitfalls of Pediatric Practice" before the Oconee County Medical Society at Walhalla, August 9.

## VIRGINIA

**Personal.** — Dr. Robert V. Funston, Detroit, has been appointed professor of orthopedic surgery at the University of Virginia School of Medicine, succeeding Dr. Allen F. Voshell. Dr. Funston is a native of Virginia and a graduate of the university. Before going to Detroit in 1922 he was associated with the department of orthopedic surgery at the University of Iowa School of Medicine.——Dr. Roy K. Flannagan, assistant state health commissioner, has been detailed as medical adviser to the state department of public welfare.——Dr. Samuel T. A. Kent, Ingram, recently completed fifty years of practice in Halifax County.

**Illegal Practitioner Sentenced.**—J. E. Gore, St. Albans, W. Va., is reported to have been fined $50 and costs and sentenced to six months in jail in Lexington after a hearing before Justice of the Peace Charles Cummings, August 11, on a charge of practicing medicine without a license. The jail sentence was suspended on condition of good behavior for the next thirty years and until he should become qualified to practice medicine in Virginia. It is said that Gore has for several years come into Rockbridge County at intervals to treat persons with cancer or supposed cancer with caustic pastes, collecting $100 or more in some cases. In addition to paying the fine and costs, he was required to return $456.25 which he had collected from Lexington residents, according to the report.

## GENERAL

**Outbreaks of Typhoid.**—Two deaths are reported to have occurred in an outbreak of typhoid in a religious cult in De Kalb County, Ala. It was said that when fifteen members of the cult became ill they refused medical aid until after the two had died.——Ninety-three cases of typhoid have been reported in Philadelphia since January 1, in comparison with forty-nine in the same period of 1931.——Summonses were served on 100 beach pedlers and 60 proprietors of stands at Coney Island, N. Y., August 28, in a campaign against typhoid, which is said to be unusually prevalent in adjacent areas.——An epidemic of paratyphoid has been reported from Clarion County, Pa., affecting about sixteen persons. One death occurred, that of Dr. Charles C. Huston, Knox, who died August 8. The source of the infection had not been determined at that time.

**Radium-Active Company's Remedies Not Therapeutic.**—The Federal Trade Commission has ordered Radium-Active Remedies Company, Pittsburgh, to stop representing that its products cure diseases or pathologic conditions of the human body or that they are radioactive unless they have radioactivity sufficient to give or add to the products a therapeutic effect when used in this capacity. The commission found that the substance used as an ingredient which was claimed to be radioactive had in fact a radioactivity of less than 2.32 millimicrograms of radium a gram. According to the commission, there is no therapeutic effect derived from the use of any medicament or medical appliance prescribed or used for the relief of disease or human ailments which has a radioactivity of this percentage. None of the persons in charge of the company or employed by it were licensed practitioners in medicine, it was said. Two of the officers who had been with the organization since 1928 were plumbers, one a high school teacher and one a chiropractor. It was brought out that the company's medical adviser did not know how to measure the radioactive substance which was said to be an ingredient of its products, nor did he know its name or identity. The commission held that the company's representations were calculated to mislead the public into buying its products for treatment of diseases in preference to products of competitors.

**Society News.**—The nineteenth annual session of the International Association of Industrial Accident Boards and Commissions will be held in Columbus, Ohio, September 26-30. Medical questions to be discussed include: "Common Hazards in Industry," Dr. Emery R. Hayhurst, Columbus; "What Determines Compensability of Skin Disease Among Industrial Workers," Dr. Carey P. McCord, Cincinnati; "The Traumatic Head Case," Dr. Fred B. Harrington, Weirton, W. Va., and "Functional Neuroses: Their Nature and Relation to Injury," Dr. George T. Harding, Jr., Columbus.——J. P. Kobrzynski, D.D.S., Chicago, was elected president of the Polish Medical and Dental Association of America at the annual session in Wilkes-Barre, Pa., August 20. Drs. Peter F. Czwalinski and John A. Czachorski, both of Chicago, were elected secretaries. The next annual session will be held in Chicago in August, 1933.——Dr. Frederick C. Warnshuis, Grand Rapids, Mich., was elected president of the Aero Medical Association at its annual meeting in Cleveland, September 4, and Dr. Albert M. Mitchell, Terre Haute, Ind., vice president.——Dr. John P. O'Connell, Chicago, was elected president of the International Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissioners at its annual convention in Montreal, September 10. The 1933 session will be held in Chicago.——The Frisco Railway Surgeons' Association will hold its annual meeting, November 14-15, in Memphis, Tenn.——The American Academy of Physical Therapy will hold its annual meeting at the Hotel Walton, Philadelphia, October 12-14.

**Bequests and Donations.** — The following bequests and donations have recently been announced:

National Jewish Hospital, Denver, $10,000 by the will of Mrs. Jeannette D. Beaumont.

William Crispe Hospital, Plainwell, Mich., $35,000 by the will of Mrs. Katherine Havens.

Stanford University Medical School, San Francisco, $12,000 by the will of the late Dr. Agnes Walker.

Germantown Dispensary and Hospital, Philadelphia, $10,000 by the will of Mrs. Katharine E. Aschenbach, Germantown.

Institute for the Crippled and Disabled, New York, $10,000; New York Infirmary for Women and Children, $500, and Babies' Hospital, New York, $2,500, by the will of Mrs. Adele G. Schiff.

Vanderbilt University School of Medicine, Nashville, Tenn., $3,600 for the purchase of radium, it is reported, by the heirs of the late Mrs. Leslie Warner.

Passavant Memorial Hospital, Chicago, $25,000 by the will of Mrs. A. P. Chard.

Children's Hospital, Columbus, Ohio, $1,000 by the will of the late Mrs. Ella T. Baker.

Pennsylvania and Women's Homeopathic hospitals, Philadelphia, $10,000 each by the will of John T. Morris, who died in 1915. The bequests were held in trust until the death of his sister, which occurred in January.

Flushing Hospital, Flushing, L. I., $10,000, and Trudeau Sanatorium, Trudeau, N. Y., $5,000 by the will of the late Lomax Littlejohn.

Christ Hospital, Jersey City, N. J., $25,000, and Nassau Hospital, Mineola, N. Y., $10,000 by the will of the late Mrs. May Brady Harriman.

Presbyterian Hospital, Chicago, $10,000 under the will of the late Martin A. Ryerson.

Lenox Hill Hospital, $25.000, New York, and the United Hospital Fund, $10,000 under the will of Heinrich E. F. Sandhagen.

Mansfield General Hospital, Mansfield, Ohio, $2,500 from the estate of the late Mary P. Weldon.

Presbyterian Hospital and Woman's Hospital, New York, $15,000 each; Lincoln Hospital School for Nurses, New York, Trudeau Sanatorium, Trudeau, N. Y., $10,000 each under the will of the late Mrs. Emma B. Kennedy.

Jewish Hospital, Brooklyn, $1,000 under the will of Mrs. Pauline May.

New York Society for the Relief of the Ruptured and Crippled, St. Mark's Hospital, Lutheran Hospital, Stuyvesant Square Hospital and the Home for Incurables, all of New York, $9,045 each under the will of Mrs. Amelia Walter.

Presbyterian and University hospitals and Woman's Hospital of Philadelphia, $5,000 each under the will of Miss Margaret Dornan.

Michael Reese and Mount Sinai hospitals, Chicago, $5,000 each by the will of Henry Friend.

**Report of United Fruit Company.** — Malaria, influenza, venereal disease and injuries were the most frequent causes for hospitalization among the 73,251 employees of the United Fruit Company and the 76,640 other persons dependent on the company for medical facilities, according to the twentieth annual report of the company's medical department. During 1931, 22,782 patients were treated in the company's ten hospitals in Central and South America and Cuba. There were 1,062 deaths. The total death rate for employees was 8.88 per thousand; pneumonia was the cause of the largest number, 168. Of the hospital admissions, 4,918 were for malaria, 1,440 for influenza, 1,179 for venereal diseases and 1,400 for injuries inflicted by firearms, instruments and falls. A strenuous campaign against malaria since 1926 has resulted in a decrease from 218 hospital admissions per thousand employees in that year to 79 in 1931. Ninety-one deaths were due to malaria in 1931. A total of 55,803 persons were examined in malaria surveys made during the year and the blood specimens of 7,713, or 13.8 per cent, were found to be positive. Although influenza caused the second highest morbidity rate, the cases were distributed throughout the company's divisions and there was no actual epidemic. The high incidence of injuries is partly ascribed to a revolution in Honduras; 61 of the 118 deaths from this cause occurred in the Truxillo division alone. There were 224 cases of typhoid and paratyphoid, the greatest number being reported from Santa Marta, Colombia, where polluted water caused an epidemic of 82 cases with 19 deaths. In addition to patients in hospitals, 373,699 treatments were administered at dispensaries and 12,793 persons received medical attention aboard steam-

ships or in ports. The fact that two severe cases of infectious jaundice among a number of mild cases in Santa Marta, Colombia, late in 1930 bore a notable resemblance to yellow fever led to an investigation in cooperation with the Rockefeller Institute. Definite results have not been obtained and the investigation is still in progress. Dr. Roland C. Connor, New York, became manager of the medical department in 1931, succeeding Dr. William E. Deeks, who died, July 24, 1931.

## Government Services

### Army Personals

Major Henry W. Meisch, relieved at Fort McPherson, Georgia, and assigned at Chilkoot Barracks, Alaska; Major Josiah B. Henneberger, relieved at Madison Barracks, New York, and assigned for duty in the Panama Canal Department; Major Joseph C. Breitling, relieved at Chilkoot Barracks, Alaska, and assigned at Fort Missoula, Montana; Major Baxter R. Hunter, on completion of present tour of foreign service, is assigned at Fort Howard, Maryland; Col. Thomas S. Bratton, having attained the age of 64 years, August 10, his retirement from active service is announced; Major Fielding T. Robeson, Fort Slocum, New York, has proceeded to his home to await retirement, for the convenience of the government; Col. Herbert C. Gibner, relieved at Letterman General Hospital, San Francisco, and assigned in the Hawaiian Department; Major Charles G. Sinclair, relieved at New York and assigned in Hawaiian Department.

### U. S. Public Health Service

Passed Asst. Surg. Homer L. Skinner, relieved at Savannah, Ga., and assigned at U. S. Marine Hospital, New Orleans; Asst. Surg. Russell Thomas, relieved at Boston and assigned at U. S. Penitentiary, Lewisburg, Pa.; Asst. Surg. Mason V. Hargett, relieved at Washington, D. C., and assigned at marine hospital, New York; Asst. Surg. Robert S. Baylor, Jr., relieved at New York and assigned to the marine hospital, Cleveland; Passed Asst. Surg. G. G. Holdt, relieved at Ellis Island, N. Y., and assigned at Toronto, Canada; Senior Surg. Grover A. Kempf, relieved at Vienna, Austria, about September 1, and assigned to duty in office of American Consul, Berlin, Germany; Senior Surg. George Parcher, relieved at Warsaw, Poland, about September 10, and assigned at the U. S. Marine Hospital, Stapleton, N. Y.; Surg. Peter J. Gorman, relieved at Glasgow, Scotland, about September 1, and assigned at the American Consulate, Hamburg, Germany; Passed Asst. Surg. Paul A. Neal, Jr., relieved at Palermo, Italy, about September 1, and assigned at the American Consulate, Naples; Surg. John M. Lowrey, relieved at Naples, Italy, about October 1, and assigned at the U. S. Marine Hospital, Baltimore; Surg. Herbert M. Manning, relieved at Stuttgart, Germany, September 1, and assigned at the American Consulate, Warsaw, Poland; Passed Asst. Surg. Maurice A. Roe, relieved at Hamilton, Canada, September 1, and assigned at Yarmouth, Nova Scotia. The following persons were recently promoted and commissioned as surgeons in the regular corps of the public health service: Walter G. Nelson, Calvin C. Applewhite, Roy E. Bodet, Frank V. Meriwether and Albert E. Russell.

### Change of Station in the Navy

Lieut. Cecil L. Andrews from navy hospital, Boston, to navy station, Guam; Comdr. Clarence W. Ross from navy hospital, Pearl Harbor, T. H., to navy hospital, Mare Island, Calif.; Lieut. John M. Woodard from navy station, Guam, to navy hospital, Mare Island, Calif.; Lieut. Comdr. Edward L. McDermott from submarine base, Coco Solo, C. Z., to navy hospital, League Island, Philadelphia; Lieut. Thenton D. Boaz from marine barracks, Quantico, Va., to the Asiatic Station; Lieut. Bruce E. Bradley from the naval hospital, New York, to the Asiatic Station; Lieut. John N. C. Gordon from the Norfolk Naval Hospital, Portsmouth, Va., to the Asiatic Station; Lieut. Robert D. Crawford, Jr., from the navy yard, Washington, D. C., to the Asiatic Station; Lieut. Gerard B. Creagh from the naval hospital, Parris Island, S. C., to the Asiatic Station; Lieut. Comdr. Morton D. Willcutts from the naval training station, Great Lakes, Ill., to the marine detachment, Peiping, China; Lieut. Charles V. Hatchette has submitted his resignation, effective November 30.

## Foreign Letters

### LONDON

*(From Our Regular Correspondent)*

Aug. 27, 1932.

### Poisoning by Yew Tree Leaves

An inmate of Maudsley Hospital met his death in a manner which was new to the authorities. He was an insurance company secretary, aged 26, who was admitted as a voluntary patient for a nervous breakdown. On the lawn in front of the veranda where he slept was a yew tree, and a considerable quantity of the leaves were found in his alimentary canal. At the inquest Dr. Creed, pathologist, said that the man's normal behavior, the fact that he had a meal before his collapse, suggested that he was not aware of the danger of yew tree leaves, which might not be unpleasant to the palate. The quantity found in his stomach was not consistent with casual chewing. Dr. Tennent, deputy medical superintendent of Maudsley Hospital, asked by the coroner why the big tree was not removed, replied that he did not know that it was a yew tree. He knew the yew tree as a shrub but was not aware that it grew to such a size. If he had known, he would have had it cut down. None of the medical staff knew that it was a yew tree. Evidence was given that the man was cultivating the habit of chewing leaves to supersede the habit of smoking, which he had told his wife he would give up. The coroner said that it was a most unusual case. The man was getting better and wrote cheerful letters to his wife. It did not seem that he intended to commit suicide. The jury returned a verdict of accidental death with a rider to the effect that all bushes, shrubs and trees like the yew should be removed from grounds to which mental patients had access.

A second death has occurred in London within a fortnight from an insane person eating yew leaves. The second death was of a woman, aged 63, at the Springfield Mental Hospital, Tooting. The assistant medical officer stated at the inquest that yew trees had been in the grounds over thirty years but had now been destroyed. The jury expressed the opinion that yew trees and other poisonous plants should be removed from hospitals to which mental patients have access. It is strange that while the danger of mental patients eating yew leaves has been long pointed out in works on toxicology, these London institutions should have permitted them to grow in their grounds.

### The Action of Rays on the Skin

Sir Leonard Hill, the physiologist, has made the curious observation that the prickly sort of heat felt on facing an electric fire is notably relieved on bringing close to the face an incandescent lamp screened by a sheet of glass. The one set of rays antagonizes the action of the other on the skin. The effect is not observed if a sheet of gelatin or cellophane is used as a screen. He also finds that the rays from an electric fire or dark source of heat, by acting on the skin reflexly, cause congestion of the nose and a feeling of stuffiness in those who have a deflected septum and some nasal obstruction. Those with unobstructed noses may be made sensitive by obstruction produced by a nose clip. The rays from an incandescent lamp also counteract these "nose closing" rays, and in this case the counteracting rays may act on a part of the skin other than that irradiated by the electric fire. Cooling the face prevents the nose closing effect. Hence the importance of ventilation of rooms with cool air. The skin when wet from perspiration is protected from the "nose closing" rays, and the vapor arising from a bowl of water set in front of an electric fire has the same protective influence. Glass absorbs most of the "nose closing" rays and lets the "nose opening" ones through. The latter belong to a group between about 20,000 and 30,000 angstroms, in the region of the short infra-red rays. Such

sources of heat as the open fire or modern gas fire are pleasant because they give off enough of those beneficent rays.

### The Biology of Human Nature

In a lecture on the biology of human nature, delivered at the recent meeting of the British Medical Association, Prof. Julian Huxley showed his power once again as an original thinker. He emphasized the importance of man's variability as a species. Nature tended to an enormous multiplication of species with little variation within each, but in human evolution two factors had operated to produce a result quite different from elsewhere —mass migration, which kept on bringing the variants into contact, and the fact that tradition more than structure or instinct regulated human behavior. As a result of constant migration, the divergent groups of men had never succeeded in becoming isolated physiologically. By virtue of interbreeding between migrant members, single groups came to throw up a much greater range of types, owing to Mendel's law, than would a wild species, and this produced further curious consequences. It meant that there must always remain a residuum of incomprehensibility between different members of society. The tough-minded could never really understand the tender-minded; the moron could never appreciate the philosopher, or vice versa. With a mind impelling him toward unity, political and social, man could not help generating diversity.

## PARIS

*(From Our Regular Correspondent)*

Aug. 10, 1932.

### The Complex Origin of Hematemesis

Addressing the Société des médecins des hôpitaux de Paris, Messieurs René A. Gutmann and Michel Demole reported the results of the examination of 100 patients sent to the hospital on account of hematemesis. To simplify matters, they eliminated the cases of melena. Among the hundred patients, the authors found only nineteen cases of stomach ulcer and three cases of cancer of the stomach. Hematemesis in patients with appendicitis or cholecystitis, with or without perivisceritis, is well known, and the authors emphasize its frequency. In six cases they found mild hepatic conditions, alcoholic cirrhosis and hepatic syphilis. After the elimination of a number of rare causes, such as benign tumors and gastric syphilis, there remained twenty-one cases in which no research and no exploration enabled them to establish a diagnosis; these were possibly connected with blood disorders, of vascular or splenic origin, and all little known. These cases show that one should not, in the presence of a hemorrhage of digestive origin, think solely, as is usually the case, of an ulcer or a cancer. The statistics direct attention to hemorrhages due to secondary gastric disorders (appendicitis, cholecystitis), and emphasize the importance, in the genesis of hemorrhages, of dyscrasic factors as yet but imperfectly understood.

### Diaphoresis Induced by Pilocarpine in the Treatment of Influenza

Before the Société des médecins des hôpitaux de Paris, an address of Dr. Monnerot-Dumaine was presented by Dr. Jean Troisier, which tends to restore to honor the use of diaphoresis in the treatment of various infections, a practice among the laity, the traditions of which date back to the time of Hippocrates. The practice survived for many centuries in ancient medicine, taking on the form of administration of copious hot decoctions and the wrapping of the patient in heavy woolen blankets. It is still in vogue among many primitive peoples as a means of combating intoxication, poisonous stings, and the like. Monnerot-Dumaine endeavored to use a more scientific method by resorting to hypodermic injections of pilocarpine salts. The effects, he states, were remarkable in the treatment of influenza. A simple uncomplicated inflenza at the start, even though associated with fever, usually yields to the heavy perspiration brought about by the injection of pilocarpine hydrochloride. Influenza that is well advanced, and even associated with some bronchitis, often clears up within twenty-four hours following such an injection. If the pilocarpine does not induce a heavy perspiration, the influenza is not at all affected. In that case, heavier doses of the alkaloid should be tried. The results and the mode of utilizing this method in complicated influenza, infantile influenza and influenza in the aged remain to be determined. If the favorable influence of the diaphoresis induced in influenza is confirmed, the author suggests that the method might be extended to other infections. These observations are interesting, but one must not forget that pilocarpine is not merely a sudorific and salivatory agent but affects also the sympathetic nerve and has a complex action on the heart and the lungs, for which reasons it must be administered with extreme care. But these facts do not detract from the therapeutic value of the induced diaphoresis, which has probably been unjustly discarded.

### Personal

Mr. Edward Tuck, an American citizen, has been accorded the title (only rarely bestowed) of "honorary citizen of Paris," awarded by the municipal council of the capital. Having settled many years ago in France with his wife, he has never ceased —aided by his wife—to give evidence in many ways of his attachment for the country of his adoption. He has spent lavishly his large fortune in philanthropic works. He created at Rueil, near Paris, during the war, a large admirably equipped hospital, which has become, since the war, an old people's home, which is supported entirely at his expense. A magnificent art collection that he had spent many years in assembling he presented, on the death of his wife, to the city of Paris. It occupies several rooms of the Petit-Palais, on the Champs Elysées. Mr. Tuck had already been accorded the highest rank in the Legion of Honor, and was the holder of the "grande médaille d'or" of the city of Paris.

Mr. George Blumenthal, a citizen of the United States, has been awarded the title of Grand Officer of the Legion of Honor. This distinction, rarely accorded to foreigners, is in recognition of the many philanthropic works carried out in favor of France by Mr. Blumenthal and his wife, Florine Blumenthal, and particularly the construction of modern pavilions in the hôpitaux de Paris, for which he has expended large sums.

### Deaths

At the Academy of Medicine, the death of W. W. Keen of Philadelphia, who was a foreign associate member of this society, was officially announced, and a short sketch of his life and works was presented by Professor Hartmann.

Dr. Charles Abadie has died at the age of 90. He was the Nestor of the French ophthalmologists. Reared in Bordeaux, he became, in 1868, intern in the hôpitaux de Paris and thereafter soon acquired for himself a preeminent position in his chosen specialty. He published numerous works, the most important of which dealt with trachoma, glaucoma, the various forms of atrophy of the optic nerve, and the like. He was the first to employ to a wide extent in France, in spite of the opposition of the syphilologists, intravenous injections of mercuric cyanide in numerous diseases of the eye. Having an active mind and a wide literary culture, he preserved in his extreme old age the use of his intellectual powers and his working energy. Only two years ago, he presented, before the Academy of Medicine, a remarkable communication on the medical treatment of glaucoma.

### Dermatitis from Wrist Watch

In the *Annales de dermatologie*, Dr. Dubois calls attention to two peculiar cases of dermatitis caused in women by the wearing of wrist watches. Both patients observed a roundish red spot of regular appearance about the size of the wrist watch, and located at the point of application of the watch. In one of

the women, the eruptive manifestation was more acute. An erythematous, squamous disk, roundish and somewhat infiltrated, could be observed. The surface, which was oozing slightly, was dotted with small, clear vesicles and crusts. The lesion yielded in three weeks to treatment with calming pastes. The cause of the dermatitis was an idiosyncrasy toward nickel, a thin coating of which covered the steel case of the watch. Such instances are rare, when it is considered what a large number of women wear such watches, which originated in Geneva. Moreover, the parents and two sisters of one of the patients wore these watches without any inconvenience. The lesions in the cases cited appeared about a week after the watches were first put on. To verify the diagnosis, a nickel twenty-five centime piece was fastened to the wrist; a week later, the cutaneous reaction appeared.

## BERLIN

*(From Our Regular Correspondent)*

Aug. 8, 1932.

### Expenditures for Food and Luxuries in the Families of Workmen

In a work recently published by the Federal Bureau of Statistics, "Die Lebenshaltung von 2,000 Arbeiter-, Angestellten- und Beamtenhaushaltungen," will be found highly interesting and valuable researches for the estimation of the financial condition of workmen, employees and petty officials in Germany. These statistics cover the period from March 1, 1927, to Feb. 29, 1928, and comprise records of 2,000 families (896 workmen, 546 employees and 498 petty officials) that kept careful records of their receipts and expenditures according to a definite questionnaire. The selection of the families was made in such a manner that the various sections of the *reich*, and the most important industrial groups and occupations, were represented. The large cities were given preference (80 to 87 per cent); the cities of middle size came next (12 to 20 per cent), while only a few small towns were represented.

Only married persons were considered. The average number of children (under 15 years of age) grows with the income in all three groups and does not become lower other than in the uppermost ranges (among employees and officials), which may be easily explained by the differences in the ages of the persons concerned. Moreover, in the families of the workmen the numbers are greater than in the families of the employees and of the officials, although the differences are not very marked, for the number in the families of workmen, employees and officials ran as follows: 4, 3.6 and 3.8, respectively.

On studying the incomes of the three groups in relation to the expenditures, it was found that the average annual income of the workmen was $863.25, $1,121.46 for the employees, and $1,273.30 for the officials. A comparison of the use of income in the three groups, divided according to the amount of income into five grades, reveals that in all groups the expenditures for food head the list, being proportionally highest among the workmen, in whose case they amount to 42 per cent of the total expenditures in the lowest income class, and with rising income drop comparatively rapidly, so that in the group of workmen with the largest income they amount to only 35.7 per cent, whereas in the case of employees and officials with still larger incomes they decline to 27.5 per cent.

The average protein consumption rises from the lowest to the highest income class (in all three groups) about 20 per cent, chiefly owing to the increase in the consumption of animal foods, whereas the consumption of vegetable protein is about the same in all three groups—or may be less among the officials. On an average, more animal protein than vegetable protein is consumed, which complies with physiologic demands. Also the total daily consumption of protein is in general satisfactory. Only in the two lowest income classes of the workmen does the protein consumption possibly fall below the minimum requirements. Likewise the number of calories demanded by the physiologist appears to be fully reached, among the employees and officials, by the amount of food ingested, whereas in the lowest income classes of the workmen there is a slight deficit. The expenditures for luxury articles of consumption, especially alcoholic beverages, appear rather high. The amounts expended per family run as follows: among the workmen, 104 liters of beer, 1.8 liters of brandy, 8.5 liters of wine, the annual cost of which was $20.08; among the employees, 77 liters of beer, 2.5 liters of brandy, 10.5 liters of wine, the annual cost of which was $20.07; among the officials, 79.5 liters of beer, 2.4 liters of brandy, 12.7 liters of wine, the annual cost of which was $21.61. In point of fact, the average consumption of alcoholic beverages in Germany for the aforementioned period was considerably larger, as is expressly emphasized in the statistics. It may be assumed, therefore, that the families considered in this scrutiny were more abstemious than the average. In any event, the consumption of alcoholic beverages was rather large, whereas the expenditures for "education" were considerably less than for alcoholic beverages and tobacco.

### The Requirements for Recognition as a Specialist

It is only natural that, with the perfection of diagnostic and therapeutic methods and the recognition of special branches of medicine, physicians should devote themselves to certain specialties. At first there was the differentiation "general practitioner," "surgeon" and "obstetrician." Further differentiation brought the ophthalmologist, the laryngologist, the rhinologist, the otologist, the gynecologist, the dermatologist, and many others. Many of the early specialists acquired the right to be regarded as such by virtue of special talent widely demonstrated in a certain field of medicine. They had been general practitioners, but, on discovering their talent and liking for a more restricted practice, they had devoted themselves more and more to that practice and with such success that they decided to confine themselves entirely to that field. At a later period, many claimed the right of announcing themselves as specialists by reason of having served for varying lengths of time as assistant to a well known and recognized specialist in a given branch of medicine. Still later, patients made the acquaintance of the so-called six weeks specialists, who had taken a short course somewhere and then sought out a location as "specialist." In view of these loose conditions, the medical profession of Germany launched, a number of years ago, a campaign to bring about that no physician be permitted to announce himself as a specialist in a given branch of medicine until he had demonstrated that he actually possessed special ability in that field. At first, however, no suitable way of demonstrating the possession of special ability in a chosen field was discovered. Neither the medical profession nor the governmental authorities took kindly to the suggestion that would-be specialists be required to subject themselves to a special examination, which if successfully passed would entitle them to a specialist's diploma and would authorize them to practice their chosen specialty. On the other hand, the medical profession proposed and adopted a set of criteria or regulations on the basis of which German physicians might recognize a colleague as a specialist, and which provided further that the term "specialist" should be restricted to definitely recognized branches of medicine. These criteria have been revised and amplified, and, as they now stand, they state the varying periods of time that are considered the minimum necessary for training in the various specialties and what kind of special training appears suitable. On the basis of documentary evidence submitted, the local medical organization decides whether a petition for recognition as a specialist in a given branch of medicine shall be approved. In case the petition of an applicant is rejected, he may take a final appeal to the "chamber of

physicians" *(aerztekammer)* having jurisdiction in the region in question.

It took some time before the new procedure for the recognition of specialists was accepted and put into practice by the medical organizations, but it may be vehemently declared that, the more consistently it has been applied, the more feasible it has been proved to be. According to the regulations governing at present the admission of panel physicians to practice in the *krankenkassen*, or health benefit associations, no specialist will be recognized who has not been approved by a competent medical organization.

The following specialties have been definitely recognized as such: surgery, diseases of women and obstetrics, orthopedics, diseases of the eye; diseases of the throat, nose and ear; diseases of the skin and genital diseases, urology, nervous and mental diseases, roentgenology and light therapy; diseases of the teeth, jaws and mouth (in addition, license as dentist required); internal medicine (including nervous diseases), diseases of the stomach and intestine and disorders of metabolism (disorders of the respiratory tracts), and children's diseases (only children under 14 years of age; treatment [including consultations] of adults is positively prohibited). These specialists must confine themselves, in the main, to their specialty and to consultative office hours and institutional service; that is to say, they may make house calls only in emergencies and must avoid anything like the ordinary domiciliary practice of the general practitioner.

The period of special training required of applicants for admission as "specialist" varies with the specialty, being at least four years for surgery, gynecology, obstetrics and internal medicine, and three years for the remaining branches. The announcing of oneself as a specialist in more than one branch or for branches other than those named will not usually be permitted; exceptions are, for example, surgery and orthopedics, surgery and gynecology, if the preliminary training is adequate, covering at least six years. It may be said now, after the regulations have been in operation for a few years, that these criteria have proved their value and have clarified to a great extent a previously bad situation.

## RIO DE JANEIRO

*(From Our Regular Correspondent)*

July 15, 1932.

### Vaccination Against Yellow Fever

Dr. H. de Beaurepaire Aragão, head of the Instituto Oswaldo Cruz, recently published an article on the prevention of yellow fever by means of immunizing vaccines. Although the problem has been discussed ever since the time of Pasteur, it was not until recently that it was more clearly understood and later made practical. In the first attempts at immunization, the vaccines were prepared by killing the yellow fever virus (present in the organs of Macacus rhesus previously infected with yellow fever) with solution of formaldehyde. Later, chloroform, glycerin and phenol (carbolic acid) were used, instead of formaldehyde, as agents to kill the virus, without impairing its immunizing properties. But the immunity conferred by the formaldehyde vaccines was not lasting. In a review of the entire problem, it was found that the failure of the vaccines to lead to the development of antibodies was due to the use of a killed virus in the preparation of the vaccine and that, by preparing the vaccines either with a living virus of an attenuated virulence or with a virus previously neutralized by a certain technic, lasting immunity is obtained. Immune serum (that is, the blood serum of men who have had yellow fever or of a Macacus rhesus monkey that survived an experimental infection) has a protective action which prevents the development of the disease, as proved by the lack of any reaction in normal men or monkeys that are given an injection of yellow fever virus after a previous injection of immune serum. De Beaurepaire Aragão succeeded in obtaining lasting immunity in Macacus rhesus by the inoculation of 2 cc. of blood serum of either convalescents or monkeys that had been immunized by the injection of 1 cc. of blood which contained yellow fever virus of great potency. The animals that received the injection did not show any general or local serious reactions, either after the immunizing vaccine or later, when a new injection of 0.1 cc. of yellow fever virus was given to them. The immunity thus conferred proved to be present even six months later. The same satisfactory results were obtained when the technic was slightly modified, by making the two injections (that of immune serum and that of virus) simultaneously, thus shortening the time of the procedure. Shortly after the method of the vaccination was reported, several laboratories in which yellow fever work is done confirmed its value. Findlay and Hindle reported their results in Macacus rhesus (*Brit. M. J.* **1**:740 [May 2] 1931; abstr. THE JOURNAL, July 18, 1931, p. 210). Shortly after, Sawyer, Kitchen and Lloyd reported satisfactory results in vaccinating human beings against yellow fever with immune serum and virus fixed in mice (*Proc. Soc. Exper. Biol. & Med.* **29**:62 [Oct.] 1931). Immunization was obtained in ten persons by the injection of a mixture of immune serum and living virus, after a previous injection of serum from convalescents. The blood serum from those persons acquired the power to protect Macacus rhesus against yellow fever, thus proving the acquired immunity of the individuals. Sellards and Laigret reported satisfactory results in vaccinating five persons (*Compt. rend. Acad. d. Sc.*, May 2, 1932). The authors injected the persons to be immunized with a living virus of yellow fever, fixed for mice only. It has been proved that the virus provokes an infection of an attenuated virulence in Macacus rhesus and probably also in man (although one should remember that three instances have been reported of benign but typical yellow fever infections of laboratory origin through the virus in white mice). The basic principle of the vaccination is the use of a living virus. Up to the present, there have been four methods of vaccination, the results of which should be compared so as to choose the one that may give the best results.

### Coexistence of Vincent's Angina and Diphtheria

Dr. Mangabeira Albernaz recently read a paper before the Sociedade de Medicina e Cirurgia of the city of Campinas in the state of São Paulo, on the coexistence of Vincent's angina and diphtheritic angina, which is rare. The author warns against confusing the association of these two forms of angina with those cases in which one form only is present but in which the etiologic agents of both forms are present. The speaker believes that the clinical diagnosis is more important than the microscopic diagnosis. The microscopic diagnosis is of great value as a confirmation of the results of the clinical diagnosis. If the angina improves under the effect of the serum or of local bismuth treatment, this proves that there is not a true association of the two forms of angina even though the examination has shown the presence of the etiologic agents of both forms. That is the reason why the benign ambulatory forms of both diphtheria and fusospirochetosis are spontaneously cured. The only thing that proves the simultaneous existence of the two diseases is the presence of the different types of false membranes. The membranes in diphtheria are continuous, pale yellow, adherent and with loose lateral edges. The membrane in fusospirochetosis is dark, is fragile, and exists only for a short period of the disease. In cases in which the coexistence of the disease is well proved, the treatment must be mixed: serum in large amounts and local bismuth treatment. The treatment gives good results because in cases in which the two diseases coexist there is a reciprocal action of the virulence of the two etiologic agents. The author reports three cases in which both diseases were present and in which the diagnosis was made by the clinical examination and confirmed by the laboratory tests.

## CAPE TOWN

*(From Our Regular Correspondent)*

July 29, 1932.

### The Medical Congress

The twenty-sixth South African Medical Congress was held last month at East London. Although the attendance was small, largely owing to the fact that so many medical men who can afford to leave their practice have gone overseas to attend the centenary meeting of the British Medical Association in London, the meeting was one of the most successful held since the war. The opening address by Sir Carruthers Beattie, vice chancellor of the University of Cape Town, attracted considerable attention, dealing as it did with the much discussed topic of overcrowding of the profession and of the medical schools in this country. Sir Carruthers is of the opinion that South Africa should have many more physicians than it has at present. He pointed out that in some parts the proportion was one physician to fifty thousand patients, and that our annual wastage was at present not compensated for by our annual number of graduates, but that we still have to import medical men from abroad. The address has been much discussed, and it is safe to say that Sir Carruthers' view is not that held generally, the consensus being that, in both urban and rural areas, medical practice holds out so little that is attractive that new comers are to be discouraged. Some also think that the medical schools have reached the limit of their usefulness, as there is not enough clinical material. This argument is on the face of it absurd, for both Cape Town and Johannesburg have populations that are large enough to provide ample clinical material for teaching purposes provided it is properly organized. At present much of this material is wasted because it is not coordinated with the university classes, with the result that few students are aware of its value. At Cape Town, for example, much of the polyclinic work, which in continental centers is regarded as so valuable an adjunct in teaching, is in charge of specialists who do not teach and is rarely seen by the students. There is little doubt that Sir Carruthers' address has stimulated discussion and may lead to important developments in the near future. The Medical Association of South Africa has appointed a special committee to consider, generally, the medical curriculum and the provision made for medical teaching at our two universities, and this committee will be in close cooperation with the standing committee on insurance and medical practice.

Among the many interesting papers read at the congress was one read before the Section of Public Health by Dr. Laidler of East London. His subject was the interrelation between European and native ill health, and he showed how the neglect to provide adequate medical service for our native and Negro population reacts on the white community. The paper was remarkable for its careful and detailed analysis of vital statistics and for the broad generalizations that were made. It led to a vigorous discussion, the final result of which was that congress passed a resolution urging the government to take a native census, since without proper statistics it is impossible to arrive at any definite conclusions on many points of great importance.

#### THE MEDICAL ASSOCIATION OF SOUTH AFRICA

At the congress the Medical Association of South Africa held its triennial election of executive officers. Dr. Orenstein, who for six years has served as its president and who did not offer himself for reelection, retires in favor of the vice president, Dr. Sandes of Cape Town. Dr. Sandes is one of the senior surgical specialists in the union, a lecturer on surgery at the University of Cape Town, and an old member of the old South African Committee of the British Medical Association. In his place, as vice president, was elected Sir Spencer Lister, the director of the Medical Research Institute at Johannesburg, while on the executive committee are Sir Edward Thornton, Dr. Orenstein and Dr. Moffat of Cape Town.

#### THE NEW MEDICAL OFFICER OF HEALTH FOR THE UNION

The medical officer of health for the union, Dr. Mitchell, retired this year, and has been succeeded by the second in command at the department, Sir Edward Thornton. Sir Edward is an old public health officer who has had considerable experience with health work in the native territories. He did excellent service in the late war, organizing hospital services both here and in France; for his work at the front he received the honor of knighthood. On his return from active service he was appointed director of medical services to the union defense force, an important post which he has since held in conjunction with his official post as assistant medical officer of health for the union. In his new capacity as medical officer of health he is both chief public health official and the administrative head of his department, as he is also secretary of public health.

### Eruptive Fevers of the Typhus Group

Considerable attention is being paid by Cape and Natal pathologists to certain types of fever that are becoming increasingly common. There is still much doubt as to what category these fevers should be grouped into, but it is generally agreed that they present points of close clinical similarity to typhus. Wicht of Cape Town and Ross of Rhodesia, who have both devoted considerable time and attention to the serologic study of these fevers, are of opinion that they closely approach the Mexican tabardillo in one group and the tsutsugamushi disease of Japan. Conor and Bruch described similar syndromes in Algeria, but in those days the Weil-Felix reaction was not known. In South Africa, similar types of fevers have been described since 1911. Clinically they closely resemble typhus, but before the development of the typical rash the patients do not present symptoms that are diagnostic of the condition, so that the three most characteristic features of the disease have to be carefully looked for. These are the primary ulcer, due to the bite of the vector, whatever it may be, the temperature chart curve, and the rash itself. The rash mimics that of measles; indeed, in children it is often mistaken for that disease, especially as it appears on the fourth day after the patient has shown signs of feverishness and malaise. It is present on the mucous membranes of the nose and mouth as well as on the skin. Treatment so far has been purely symptomatic. Ross and Wicht incline to the view that the disease is carried by fleas, but that opinion is not shared by some pathologists, who consider that this form of typhus is merely tick bite fever, such as is well known and has been frequently described. There seems no doubt, however, that the condition does present differences from ordinary tick bite fever and that in this country we have to do with three distinct forms of typhus, one carried by lice, one by ticks and a third by some parasite of the rat, most probably a flea.

### Protein Shock in the Treatment of Dementia Paralytica

Laubscher of the Valkenburg Mental Hospital has studied the results of the treatment of dementia paralytica by protein shock, tryparsamide and tartro-quiniobine in a series of cases not specially selected. He contributes to the *South African Medical Journal* an interesting summary of his observations, together with the case histories. His study deals with fourteen cases. Eight were social recoveries. Three patients who died showed Herxheimer reactions after recovery. Five remained unimproved, one of whom died at the beginning of treatment, and one improved both mentally and physically. The shock treatment was in the form of 10 cc. of milk given intramuscularly, followed, six hours later, by 1 Gm. of tryparsamide in 5 cc. of distilled water injected intravenously.

## Marriages

WILLIAM JOSEPH MORGINSON, Wheeling, W. Va., to Miss Elizabeth Jane Eitzen of California, Mo., September 6.

PERK LEE DAVIS, Philadelphia, to DR. MARGARET HENDERSON SHUMWAY of Bryn Mawr, Pa., September 4.

HAROLD CHARLES LUETH, Chicago, to Miss Elizabeth Adelaide Bullock of Oak Park, Ill., September 3.

FORREST LE ROY STRATTON, Kilgore, Texas, to Miss Karna May Billberg of Nowata, Okla., September 2.

ELBERT LAPSLEY PERSONS, Durham, N. C., to Miss Helen Hopkinson Coles of Summit, N. J., June 11.

CHARLES H. WHITE, Fenton, Mich., to Miss Bess N. Knowles of Detroit, June 25.

W. L. WEBER, Philadelphia, to Miss Anna Ruth Bialy of Collingswood, N. J., May 25.

DON SHELLEY BENSON, Elm Grove, W. Va., to Miss Gwen Kirker of Wellsburg, June 2.

EDMUND RALPH CARMAN, New Lenox, Ill., to Miss Elsa Friday of St. Louis, June 11.

LOUIS C. BARRETTE to Miss Muriel Bradford, both of Sacramento, Calif., August 15.

WALTER A. BRUSSOCK to Miss Cheryl Miller, both of Milwaukee, September 1.

J. FRANK MAURER, Brazil, Ind., to Miss Susan Delbrook of Indianapolis, July 20.

JACOB POMERANTZ to Miss Mollie Orloff, both of Philadelphia, August 14.

JOSEPH W. KELSO, Oklahoma City, to Mrs. Elsie E. Carter, July 20.

MEYER ZELTZER, Erie, Pa., to Miss Esther Bergoon, recently.

## Deaths

**Theodore August Hoch,** Northampton, Mass.; University of Michigan Medical School, Ann Arbor, 1900; member of the Massachusetts Medical Society, American Psychiatric Association and the New England Society of Psychiatry; assistant professor of psychiatry, Tufts College Medical School; medical superintendent of the Northampton State Hospital; aged 53; died, August 4, of hemorrhage due to duodenal ulcer.

**Edwin Page Bledsoe,** Sykesville, Md.; College of Physicians and Surgeons, Baltimore, 1905; served during the World War; superintendent of the Springfield State Hospital; formerly superintendent of the Arkansas State Hospital, Little Rock, and medical officer in charge of the U. S. Veterans' Hospital, North Chicago, Ill.; aged 51; died, August 11, in Baltimore.

**Andrew Samuel Moorhead,** Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1906; fellow of the American College of Surgeons; served with the Canadian army during the World War; at one time demonstrator in clinical surgery at his alma mater; formerly on the staffs of the Toronto General and the Wellesley Hospital; aged 55; died, July 31.

**John Jacob Conzett,** Auburn, N. Y.; Miami Medical College, Cincinnati, 1899; member of the Medical Society of the State of New York; veteran of the Spanish-American and World Wars; medical school inspector; aged 58; died, August 9, in the Auburn City Hospital, of empyema of the gallbladder, chronic hepatitis and paralytic ileus.

**Harris L. Cookingham,** Red Hook, N. Y.; Albany (N. Y.) Medical College, 1871; member of the Medical Society of the State of New York; past president of the Dutchess County Medical Society; formerly president of the school board, postmaster and health officer; aged 81; died, June 28, in a hospital at Rhinebeck.

**Jacob J. Entz,** Wichita, Kan.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1886; at one time member and epidemiologist to the state board of health; for seven years health officer of Marion County; formerly on the staff of the State Hospital, Norton; aged 68; died, June 29.

**Hugh Boyd,** Scottsboro, Ala.; Memphis (Tenn.) Hospital Medical College, 1899; member of the Medical Association of the State of Alabama; past president of the Jackson County Medical Society; served during the World War; aged 51; died suddenly, August 6, of angina pectoris.

**Joseph Frederick Terriberry,** New York; Bellevue Hospital Medical College, New York, 1880; formerly on the staffs of the Hospital for the Ruptured and Crippled and the Manhattan Eye, Ear and Throat Hospital; aged 75; died, July 28, at his summer home in Canaan, Conn.

**Charles Melvin Ericsson,** Gowrie, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; member of the Iowa State Medical Society; for many years member and president of the school board; aged 60; died, July 29, in the Lutheran Hospital, Fort Dodge.

**George Gordon Campbell,** Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1889; formerly clinical professor of dermatology at his alma mater; for many years on the staff of the Montreal General Hospital; aged 68; died, June 26.

**George S. Stone,** Fort Myers, Fla.; University of Maryland School of Medicine, Baltimore, 1890; member of the Florida Medical Association; past president of the Lee County Medical Society; on the staff of the Lee Memorial Hospital; aged 63; died, June 1.

**James Monroe Dampeer,** Crystal Springs, Miss.; Medical Department of the Tulane University of Louisiana, New Orleans, 1892; member of the Mississippi State Medical Association; formerly member of the state board of health; aged 64; died, July 14.

**Robert Eben Hearne,** Paducah, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; member of the Kentucky State Medical Association; served during the World War; aged 56; died, July 28, of carcinoma of the liver.

**Charles L. Scott,** Sanford, N. C.; University of Maryland School of Medicine, Baltimore, 1897; member of the Medical Society of the State of North Carolina; served during the World War; aged 56; died, July 26, of sarcoma of the spine.

**Everett J. Stewart Scofield** ⊕ Danbury, Conn.; University of North Carolina School of Medicine, Chapel Hill, 1908; formerly health officer of Danbury; for fifteen years on the staff of the Danbury Hospital; aged 52; died, July 16.

**Charles William Aitkin,** Flemingsburg, Ky.; Medical College of Ohio, Cincinnati, 1880; member of the Kentucky State Medical Association; for many years bank president; aged 72; died, August 10, of streptococcic meningitis.

**Eli Nichols** ⊕ Wilmington, Del.; University of Pennsylvania School of Medicine, Philadelphia, 1915; on the staff of the Delaware Hospital; aged 43; died, July 25, in the Johns Hopkins Hospital, Baltimore, of chronic myocarditis.

**William Morrison Robinson,** Jersey City, N. J.; University of Georgia Medical Department, Augusta, 1908; on the staff of the Greenville Hospital; aged 47; died, May 27, in Danville, Va., of a self inflicted bullet wound.

**John Hill Focht** ⊕ Shamokin, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1921; formerly proprietor of a hospital bearing his name; aged 40; was found dead, August 9, of illuminating gas poisoning.

**Edith Mackay Ross,** Winnipeg, Manit., Canada; Manitoba Medical College, 1913; member of the Associated Anesthetists of the United States and Canada; on the staff of St. Boniface (Manit.) Hospital; aged 43; died, May 13.

**Marcus Bradford Carleton,** Wooster, Ohio; Medical Department of the University of the City of New York, 1881; for many years a medical missionary in India; aged 76; died, July 24, in Xenia, of heart disease.

**Henry Adams Waldron** ⊕ Newburgh, N. Y.; Albany Medical College, 1877; aged 77; on the staff of St. Luke's Hospital, where he died, August 1, as the result of injuries received in an automobile accident.

**Charles Carlisle Conser** ⊕ Baltimore; University of Maryland School of Medicine, Baltimore, 1900; associate professor of physiology at his alma mater; aged 56; died suddenly, August 6, of heart disease.

**Oliver Brewster Babcock,** Springfield, Ill.; St. Louis Medical College, 1879; aged 75; died, August 6, in the Decatur-Macon Hospital, Decatur, of heart disease, pulmonary edema and cerebral hemorrhage.

**Ernest H. Madajesky,** Ironwood, Mich.; College of Physicians and Surgeons, Chicago, 1899; member of the Michigan State Medical Society; formerly a druggist; aged 61; died, July 20, of cerebral hemorrhage.

**Rollin Guy Hendricks,** Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1903; on the staff of the Indianapolis City Hospital; aged 54; died, July 24, of hypernephroma of the right kidney.

**John Morgan Holloway,** Jersey City, N. J.; New York Homeopathic Medical College and Hospital, 1893; member of the Medical Society of New Jersey; aged 63; died, July 31, in Sparta, of heart disease.

**Frank Robert Maxwell,** Martinsville, Ind.; Medical College of Indiana, Indianapolis, 1895; served during the World War; aged 60; died, July 10, in St. Vincent's Hospital, Indianapolis, of heart disease.

**Lucius L. Ball,** Muncie, Ind.; University of Buffalo School of Medicine, 1889; member of the Indiana State Medical Association; aged 82; died, July 22, of chronic urinary sepsis and prostatic hypertrophy.

**Elmer P. Blankenship,** Houston, Mo.; St. Louis University School of Medicine, 1909; also a druggist; served during the World War; aged 56; died, July 10, of uremia and cirrhosis of the liver.

**Silas O. Kimbro,** Monticello, Ark.; University of Nashville (Tenn.) Medical Department, 1906; member of the Arkansas Medical Society; aged 52; was found dead in his office, July 17, of heart disease.

**Alden Edwards Martin,** Hackettstown, N. J.; Hahnemann Medical College of Philadelphia, 1876; at one time mayor; formerly member of the board of health; aged 84; died, July 7, of myocarditis.

**George R. Christian,** Indianapolis; Medical College of Indiana, Indianapolis, 1897; member of the Florida Medical Association; aged 62; died, August 9, in St. Vincent's Hospital, of heart block.

**Frank Pierce Johnson,** St. Louis; Cleveland Medical College, 1877; member of the Missouri State Medical Association; aged 81; died, July 19, in the St. Louis County Hospital, of heart disease.

**Zolley B. Ferrell,** Parkersburg, W. Va.; Chicago College of Medicine and Surgery, 1916; aged 48; died, April 9, in the City Hospital of embolism, following an operation on the gallbladder.

**Jean Henriette Celce,** Holyoke, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1892; member of the Massachusetts Medical Society; aged 62; died, July 30, of septicemia.

**Samuel H. Blakely,** Severance, Kan.; Louisville (Ky.) Medical College, 1875; also a druggist; aged 82; died, July 23, in the Methodist Episcopal Home for the Aged, Topeka, of senility.

**John Frederick Shrontz,** Martinsburg, Ohio; Physio-Medical Institute, Cincinnati, 1877; formerly member of the county school board; aged 82; died, July 26, of cerebral hemorrhage.

**John H. Carson,** Vancouver, B. C., Canada; Medical College of Indiana, Indianapolis, 1892; aged 70; superintendent of the Provincial Home for Incurables, where he died, May 17.

**Patrick John Kelly,** Patton, Pa.; Medico-Chirurgical College of Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; aged 56; died, July 23, of pneumonia.

**Frank Lisle Rose,** Brooklyn, Mich.; University of Michigan Medical School, Ann Arbor, 1886; formerly health officer of Saginaw County; aged 74; died, July 15, of heart disease.

**Harry Francis Bailey,** Monongahela, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; served during the World War; aged 46; died, July 14, of pneumonia.

**Leland Carson McIntosh,** Henderson, N. C.; Atlanta College of Physicians and Surgeons, 1913; served during the World War; aged 53; died, July 14, of chronic encephalitis.

**George Leo Helms,** Los Angeles; Medical Department of the University of California, 1895; aged 60; died, June 8, in the Stockton (Calif.) State Hospital, of cerebral hemorrhage.

**Joseph Brewer Blades** ⊕ Independence, Kan.; Kansas City Medical College, 1905; on the staff of the Mercy Hospital; aged 56; died, July 25, in Madison, Wis., of arteriosclerosis.

**Frederick Carlyle Hyatt,** Greensboro, N. C.; Jefferson Medical College of Philadelphia, 1907; aged 47; died, July 28, at Waynesville, of cardiovascular renal disease.

**Joseph M. Hartranft,** Southold, N. Y.; Hahnemann Medical College of Philadelphia, 1879; formerly health officer of Southold; aged 74; hanged himself, July 19.

**Otto F. Fischer** ⊕ St. Louis; Missouri Medical College, St. Louis, 1895; aged 60; died, July 13, in a hospital at Oshkosh, Wis., of a ruptured esophageal varix.

**Wilbur Aaron Griffith,** Coldwater, Mich.; Keokuk (Iowa) Medical College, 1898; served during the World War; aged 64; died, June 27, of chronic myocarditis.

**Le Roy Pence,** Lima, Ohio; Medical College of Ohio, Cincinnati, 1882; aged 76; died, July 10, in the Lima City Hospital, of cardiovascular renal disease.

**John Hedges,** Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1901; aged 59; died, August 8, of chronic endocarditis and myocarditis.

**Charles Ballance Holmes,** Silver City, Miss.; Louisville (Ky.) Medical College, 1885; aged 68; was accidentally drowned, July 21, while fishing.

**Alva Guy Thomas,** Salt Lake City, Utah; Indiana University School of Medicine, 1917; aged 42; was found dead, July 21, of a gunshot wound.

**Harriet Hodges Cobb,** Cambridge, Mass.; Boston University School of Medicine, 1878; aged 93; died, July 11, in Medway, of arteriosclerosis.

**George Westgate Mills,** Medford, Mass.; Harvard University Medical School, Boston, 1879; aged 79; died, July 27, at Lexington, of heart disease.

**Jack Hamilton Evans,** Sault Ste. Marie, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1924; aged 35; was drowned, June 27.

**Joshua Mearne Wardell** ⊕ Cadillac, Mich.; University of Michigan Medical School, Ann Arbor, 1873; aged 77; died, August 1, of heart disease.

**Deas Murphy,** Litchfield, Conn.; Dartmouth Medical School, Hanover, N. H., 1897; aged 73; died, July 16, of carcinoma of the prostate.

**Clyde Scott Roath,** North Little Rock, Ark.; California Eclectic Medical College, Los Angeles, 1915; aged 55; was shot and killed, August 7.

**John Johnson Fitzsimmons,** Calcutta, Ohio; Starling Medical College, Columbus, 1895; aged 64; died, June 20, of poison, self administered.

**Seaver Zerah Fisher,** Brooklyn; Miami Medical College, Cincinnati, 1878; Civil War veteran; aged 87; died, July 9, of cerebral hemorrhage.

**Buford R. Lancaster,** Lakeland, Ky.; Cincinnati College of Medicine and Surgery, 1876; aged 79; died, July 20, of cerebral hemorrhage.

**Edwin J. Turner,** Columbus, Ga.; Flint Medical College of New Orleans University, 1902; aged 56; died, July 16, of acute myocarditis.

**Henry Charles Wendel,** Cincinnati; Miami Medical College, Cincinnati, 1894; aged 63; died, July 25, of acute dilatation of the heart.

**James Henry Miller,** Zanesville, Ohio; Leonard Medical School, Raleigh, N. C., 1911; aged 60; was drowned, July 27, while swimming.

**George Wilson Lovan,** Morton's Gap, Ky.; Kentucky School of Medicine, Louisville, 1892; aged 64; died, July 26, of heart disease.

**George Washington Miller,** Brockport, N. Y.; Detroit Medical College, 1871; aged 87; died, July 26, of senility and arteriosclerosis.

**William Charles Davis** ⊕ Chicago; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 73; died, July 13, of myocarditis.

**Harvey Lee Starkey,** Wood River, Neb.; Barnes Medical College, St. Louis, 1899; aged 67; died, July 16, of chronic myocarditis.

**George Edwin Bill,** Harrisburg, Pa.; Harvard University Medical School, Boston, 1880; aged 78; died, July 28, of angina pectoris.

**S. D. Sluyter,** Wolcott, Ind.; Kansas City Hospital College of Medicine, 1885; aged 75; died, July 24, of diabetes mellitus.

**Perry F. Shaffer,** Jacksonville, Fla.; Eclectic Medical Institute, Cincinnati, 1888; aged 65; died, July 20, of heart disease.

**John Logan Brubaker** ⊕ Deshler, Ohio; Toledo Medical College, 1898; aged 60; died, May 10.

**Edward W. Boyd,** Atlanta, Ga.; Atlanta Medical College, 1894; aged 56; died, July 13.

# Bureau of Investigation

## ADULTERATED OR MISBRANDED PHARMACEUTICALS

### A List of Some of the Notices of Judgment Issued from July, 1931, to June, 1932, Inclusive, by the Food and Drug Administration, U. S. Department of Agriculture

[For many years, the Bureau of Investigation has published in this department, brief abstracts of Notices of Judgment issued by the Food and Drug Administration of the United States Department of Agriculture against "patent medicines." The number of proprietary preparations of this type that each year are found misbranded or adulterated is so large that these abstracts have to be published frequently.

The same officials that deal with cases of adulteration and misbranding in proprietary package medicines also, of course, act to protect the public against adulterated or misbranded official pharmaceuticals. As most official products are made by reputable pharmaceutical houses, the number of cases of adulteration or misbranding in this particular group is small compared with cases in the "patent medicine" group. For this reason, the Bureau of Investigation has made a practice of abstracting each year such Notices of Judgment as have been published by the government during the previous calendar year. In THE JOURNAL for June 25, this year, there was published a list of the Notices of Judgment issued during the first half of 1931, dealing with pharmaceuticals. We now present a list of similar notices issued from July, 1931, to June, 1932, inclusive. These are arranged alphabetically by products. First is given the name of the product, then follows the name of the manufacturer, shipper, or consigner; finally the number of the Notice of Judgment and the date of issue. It is to be borne in mind that the dates of publication of the Notices of Judgment are always several months later than the date of seizure of the product.]

**Acetphenetidin Tablets.**—Syracuse Pharmacal Company, Inc., Syracuse, N. Y. *(N. J. 18195; October, 1931.)*

**Aconite Tincture.**—Sharp and Dohme, Philadelphia. *(N. J. 18726; May, 1932.)*

**Almond Oil.**—Yglesias and Company, Inc., New York City. *(N. J. 18474, March, 1932; 18975, June, 1932.)* R. Fabien and Company, Inc., New York City. *(N. J. 18960; June, 1932.)*

**Caffeine Citrated Tablets.**—Syracuse Pharmacal Company, Inc., Syracuse, N. Y. *(N. J. 18195; October, 1931.)*

**Chloroform.**—No manufacturer's or shipper's name given. *(N. J. 18201; October, 1931.)*

**Cinchophen Tablets.**—C. E. Jamieson and Company, Detroit. *(N. J. 18308; January, 1932.)* Elmira Drug and Chemical Company, Elmira, N. Y. *(N. J. 18454; March, 1932.)*

**Corrosive Sublimate Tablets.**—Elmira Drug and Chemical Company, Elmira, N. Y. *(N. J. 18454; March, 1932.)*

**Ergot.**—Imported from Hamburg, Germany; name of importer not given. *(N. J. 18029; July, 1931.)* F. W. Berk and Company, Inc., New York City. *(N. J. 18189; October, 1931.)* J. L. Hopkins and Company, New York City. *(N. J. 18216; October, 1931.)*

**Ergot, Fluid Extract.**—John Wyeth and Bros., Inc., Philadelphia. *(N. J. 18304, January, 1932; 18466, 18520, March, 1932; 18957, June, 1932.)* Hance Bros. and White, Inc., Philadelphia. *(N. J. 18489; March, 1932.)* Sharp and Dohme, Baltimore. *(N. J. 18668; May, 1932.)* Upjohn Company, Kalamazoo, Mich. *(N. J. 18659; May, 1932.)* Allaire Woodward and Company, Peoria, Ill. *(N. J. 18662; May, 1932.)*

**Ergot of Rye.**—F. W. Berk and Company, New York City. *(N. J. 18333; January, 1932.)*

**Ergot Solution.**—Abbott Laboratories, North Chicago, Ill. *(N. J. 18536; March, 1932.)*

**Ether.**—Mallinckrodt Chemical Works, St. Louis, Mo. *(N. J. 18026, July, 1931; 18182, 18186, 18199, 18219, October, 1931; 18373, 18394, 18399, February, 1932; 18683, 18750, May, 1932; 18965, June, 1932.)* Merck and Company, Rahway, N. J. *(N. J. 18027, 18039, 18050, July, 1931; 18185, October, 1931; 18316, 18318, 18330, January, 1932; 18355, 18358, 18370, 18374, 18380, 18382, 18385, 18391, 18398, February, 1932; 18459, 18463, 18467, 18478, 18480, 18495, 18511, March, 1932; 18664, 18672, 18736, May, 1932.)* American Solvents and Chemical Corporation, Albany, N. Y. *(N. J. 18033, 18046; July, 1931.)* J. T. Baker Chemical Company, Phillipsburg, N. J. *(N. J. 18383, February, 1932; 18510, 18538, March, 1932; 18673, May, 1932; 18964, June, 1932.)* New York Quinine and Chemical Works, Brooklyn. *(N. J. 18389, February, 1932; 18694, May, 1932; 18945, 18963, June, 1932.)* General Chemical Company, Philadelphia. *(N. J. 18469, 18471, March, 1932.)* Rossville Commercial Alcohol Corporation, Mechanicsville, N. Y. *(N. J. 18692, May, 1932.)*

**Ginger, Fluid Extract.**—Jordan Bros., New York City. *(N. J. 18322, 18323, January, 1932; 18488; March, 1932; 18691, May, 1932.)* Richard Ray (Emerson Medicine Company), Kansas City, Mo. *(N. J. 18367; February, 1932.)*

**Magnesium Citrate Solution.**—National Magnesia Company, Brooklyn. *(N. J. 18361; February, 1932.)*

**Malt Extract with Yerba Santa.**—Trommer Company, Fremont, Ohio. *(N. J. 18519; March, 1932.)*

**Nitroglycerin Tablets.**—Syracuse Pharmacal Company, Inc., Syracuse, N. Y. *(N. J. 18195; October, 1931.)* Elmira Drug and Chemical Company, Elmira, N. Y. *(N. J. 18454, March, 1932.)*

**Sodium Nitrite Tablets.**—C. E. Jamieson and Company, Detroit. *(N. J. 18308; January, 1932.)*

**Strychnine Sulphate Tablets.**—Elmira Drug and Chemical Company, Elmira, N. Y. *(N. J. 18454; March, 1932.)*

**Valerian Tincture.**—Jordan Bros. Company, Brooklyn. *(N. J. 18533; March, 1932.)*

# Correspondence

## NEUROSES IN MAN AND ANIMALS

*To the Editor:*—Dr. Schilder, in writing on "The Somatic Basis of the Neurosis" (*J. Nerv. & Ment. Dis.* **70**:502 [Nov.] 1929), has discussed a portion of my work on conditioned reflexes in which I have produced what I have called neuroses. The author admits that "we can find all the phenomena of the neuroses." Such a statement from a competent source I, of course, greatly appreciate. But I must strenuously object to the statements of the author relating to the comparative studies of neuroses in man and in animals. The author says: "These important experiments of Pavlov and his school can be understood only if we look upon them in the light of our experiences in the neuroses. We cannot interpret the neurosis by means of the conditioned reflex, but by means of the psychic mechanisms we have studied in the neurosis we can certainly very well interpret what takes place in a conditioned reflex."

What is the meaning of the term "interpretation" or "understanding"? It is generally understood to mean an analysis of a more complex phenomenon in terms of more elemental and simple phenomena. Accordingly, the neuroses in man must be interpreted or understood, that is, analyzed, with the help of studies of neuroses in animals, which are naturally more simple, and not by the reverse procedure.

In man, it is first of all necessary to determine exactly wherein the deviation of behavior from the normal lies in the case concerned, for there is indeed a wide variation normally in the behavior of different people. And then one should search together with the patient, or apart from him, or even against his resistance, amid the chaos of affairs vital to him, for connections, conditions and situations that have acted at once or slowly, and with which perhaps the origin of the abnormal

deviation may be justifiably linked—that is, for the origin of the neurosis. Moreover, it is necessary to understand why these conditions and situations have brought about such results in the patient, when in another person they would occur without the slightest effect; and, furthermore, why they all lead in the case of one person to just such an abnormal complex, while in another to a totally different one. I am taking only the principal group of points, omitting the vast range of those of more special nature.

But all this so far is only a part of the matter, if one undertakes a full and complete analysis of it. Of course, the change in behavior that is observed in a patient comes from a change in his nervous system. Who now will deny that? And so, an answer is still required to the question: How and why did the changes in the normal processes of his nervous system take place and of what sort were they, under the circumstances indicated?

Are not all these requirements real? And where are all these requirements satisfied?

With what does one deal in the dog? First of all, one sees that neuroses are possible to obtain and without difficulty, if only one has an animal in whose make-up there is not a proper balance between its fundamental reactions of nervous activity—as yet not further analyzed physiologically—that is, between the excitatory and inhibitory processes. This occurs either in an animal in which there is a marked predominance of excitatory processes over inhibitory, so that it is unable to exert *complete* inhibition over its actions when the situation demands it (excitatory type), or else in another in which, on the other hand, excitatory processes are so weak that the animal is often inhibited beyond proper limits, which is also inconsistent with the demands of life (inhibitory type).

Further, with such an experimental animal it is definitely known that this insufficient balance, peculiar to the make-up of the particular animal, finally breaks down under certain fundamental conditions. This happens mainly under three conditions, three circumstances. Either extremely strong stimuli in the nature of conditioned stimuli are used in the place of those that are only weak or moderately strong and which ordinarily determine the animal's activity; i. e., its excitatory processes are overstrained. Or the animal is required to exert a very strong or a very protracted inhibition; i. e., its inhibitory processes are overstrained. Or, finally, a conflict between both these processes is produced; i. e., conditioned positive and negative stimuli are applied one right after the other. In all these cases with the proper animal there develops a chronic disturbance of the higher nervous activity, *a neurosis.* The excitatory type loses almost completely its ability for any inhibition and generally becomes unusually excited; the inhibitory type, though hungry, refuses even to eat under the influence of the conditioned stimuli and generally becomes exceedingly ill at ease and also passive with the least change of its surrounding environment.

One can conceive in all likelihood that, if these dogs which have become ill could look back and tell what they had experienced on that occasion, they would not add a single thing to that which one would conjecture about their condition. All would declare that on every one of the occasions mentioned they were put through a difficult test, a hard situation. Some would report that they felt frequently unable to refrain from doing that which was forbidden and then they felt punished for doing it in one way or another, while others would say that they were totally, or just passively, unable to do what they usually had to do.

And so, what my associates and I have found with our animals is elemental physiologic phenomena—is the limit of physiologic analysis (in the present state of knowledge). At the same time it is the prime and most fundamental basis of human neurosis and serves as the truest interpretation and understanding of it.

Hence in the case of man, under the complications of his existence and with his many different reactions to it, when it comes to analysis and to the ultimate aim of curing him, one always has to face the very difficult question: "What circumstances in his life are excessively strong for the nervous system in question, where and when has he encountered a conflict intolerable for him, requirements that he become active and requirements that he hold himself back?

How in the opinion of Dr. Schilder could the innumerable subjective experiences of the neurotic patient under the extreme complexity of human higher nervous activity, as compared with dogs, give anything useful in the way of an explanation of the elementary neuroses of animals, when those experiences are only different variations of one and the same physiologic process, which is seen in dogs very distinctly?

Of course, for the final physiologic analysis of the problem of neuroses and psychoses there remain a number of undecided questions. Is it possible to produce neuroses in cases of well balanced nervous systems? Is the initial unbalance of the nervous system a primary phenomenon: i. e., an innate property of the nervous tissue itself, or a secondary one depending on some innate peculiarity of other systems of the organism apart from the nervous system? Do there not exist along with the innate properties of the nervous system also other conditions in the organism which determine this or that degree of normal function of that system?

I am busy at the present time with some of these questions and already have some material at hand for their decision.

It stands to reason that, apart from these special questions which concern the general problem of disorders of normal nervous activity, there remains before the physiologist the question relating to the physicochemical mechanism of these very elemental nervous processes: of excitation and inhibition, of their relationship, and of excessive strains on them.

I. P. PAVLOV, Leningrad, Russia.

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# *Queries and Minor Notes*

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

## POISONOUS LACQUERS ON CHILDREN'S TOYS

*To the Editor:*—1. Is there a censorship of lacquers to cover and decorate children's toys? 2. Are lacquers containing such pigments as chrome yellow or chrome green regarded or disregarded as dangerous to the average child who occasionally puts a toy in his mouth? 3. Is there much lead poisoning from placing lacquered toys in the mouth?

LOUIS E. BERNHEISEL, M.D., West Collingswood, N. J.

ANSWER.—1. So far as is known, the elimination of lead coating for toys has been brought about by the agreements between manufacturers rather than by actual laws or regulations. In addition, the cost of lead is sufficiently higher than other useful coatings to favor the use of lead substitutes.

2. Inorganic chrome yellow is lead chromate; chrome orange is lead chromate plus varying proportions of lead oxide. Chrome green is chrome yellow mixed with prussian blue. These inorganic pigments are toxic. However, organic pigments frequently retain the name of earlier existing inorganic pigments. For example, organic chrome orange is a para-nitrobenzene-azo-salicylic acid preparation. Organic pigments of this type are usually less toxic than the constituents used as intermediates. A preferance for stained toys is expressed rather than those so thickly coated that the paints may chip off and be ingested or lodge in the throat.

3. It is almost impossible to determine the extent of lead poisoning caused by the placing of toys in the mouth by children. This is due to the fact that small children, at least, are prone to place in their mouths flakes of paint picked off baseboards or dropped from walls or ceilings. Although cribs and childrens' furniture may not be coated with lead-bearing paints, full sized beds may be so finished. It is the general impression that lead poisoning of infants from toys is relatively infrequent and on the wane.

In every city, under present economic conditions, many toys are being reclaimed through such agencies as are attempting to increase employment. In addition, other unemployed individuals are engaged in making and peddling toys and novelties. Toys from these sources, rather than from standard manufacturers, are more likely to be the source of lead poisoning.

## PURINES AND ACID PRODUCING FOODS

*To the Editor:*—Diet is attracting more attention in treatment, and the present tendency is to give a fairly high protein diet for Bright's disease, avoiding as far as possible purines, which I take as meaning practically the same as foods with an acid ash. I am puzzled over the question of eggs. In THE JOURNAL, March 3, 1923, page 647, eggs, butter, milk and cheese are classed as nonpurine. R. W. Wilcox (Treatment of Disease, 1919, p. 275) put these in the same category. On the other hand, William R. Warner & Company, Inc., in the "Calendar of Medical History," 1931, sixth page from the end, put eggs under acid producing foods, egg yolk being put as 26.69 per cent (exceeded only by oysters, 30 per cent). In the pamphlet issued by a proprietary house the same figures are used, and in THE JOURNAL, Jan. 11, 1930, page 141, eggs are classed under acid producing foods. Another company in its list does not seem to mention eggs under alkali producers. I would also like to know whether tomatoes tend to acidify or alkalize the urine. Please omit name.

M.D., Canada.

ANSWER.—The term "Bright's disease" should no longer be used unless the specific type of renal involvement is considered. The disease involving the parenchyma of the kidneys is an entirely different disease from nephrosis or from what is now termed nephrosclerosis. Nephrosis is a degenerative process of the tubules, and nephrosclerosis is a disease of the smaller arteries and arterioles of the kidneys. In the former disease a low protein diet has been used for years because it is in this disease that the blood shows a retention of nitrogen products. However, at a recent meeting of the American Association of Physicians, McCann of Rochester, N. Y., showed some case reports in which a higher protein diet was apparently not at all harmful. In nephrosis, a high protein-low fat diet is indicated. However, in nephrosclerosis, usually associated with hypertension and generalized cardiovascular disturbances, the therapeutic indications for diet are based on the cardiovascular complications rather than on the kidneys.

Purines are certainly not "practically the same as foods with an acid ash." A purine-free diet is indicated in gout, and because the purines are nucleoproteins they are not advised in glomerular nephritis. The best study of the relative acid-alkaline content of foods is the one by Sherman and Gettler. In their tables eggs are classified as acid-producing food on the basis of 11.1 per cent per hundred. Egg white is 5.24 per cent and egg yolk 24.69 per cent. On the other hand, eggs do not contain purine bodies. Practically all vegetables and fruits except cranberries, prunes, rhubarb and plums are alkali producing foods.

## APHTHOUS STOMATITIS

*To the Editor:*—A single woman, aged 27, has aphthous stomatitis, which occurs more often at the menstrual period than at any other time. Otherwise she is well. Any cauterant aggravates, causing considerable inflammation in the surrounding tissue. Can you suggest any plan of treatment? Please omit name.

M.D., New York.

ANSWER.—The diet should be bland and should contain plenty of milk and spinach. The bowls should move regularly without excessive irritation from laxatives. Irritation of the mouth by strong tooth pastes, tooth powders or mouth washes should be avoided. Some calcium preparation should be given in adequate dosage for a week or more before the expected menstrual period. Of the lactate, given by mouth, from 3 to 5 Gm. should be taken after each meal, best with an equal amount of lactose dissolved in hot water.

## DIGESTIBILITY OF EGGS

*To the Editor:*—Will you kindly inform me as to the comparative digestibility of hard and soft boiled eggs. Is the taking of raw eggs of any advantage? This question concerns a normal stomach. Is there any pathologic entity in which a hard boiled egg is preferable to a soft boiled or raw egg? Please omit name.

M.D., New York.

ANSWER.—Although there are many prejudices and opinions on the question of the way in which eggs should be cooked, the consensus seems to be that cooking does not radically interfere with the food value. Apparently the method of cooking does influence the speed of digestibility and perhaps to a lesser extent the appetite. Eventually, however, eggs in any form are well digested and absorbed no matter how cooked. An article entitled "Digestion in the Normal Human Stomach of Eggs Prepared in Different Ways," by R. J. Miller, H. L. Fowler, Olof Bergeim, M. E. Rehfuss and P. B. Hawk (*Am. J. Physiol.* **49**:254 [July] 1919) is the authority for the following statements: Soft boiling or poaching of eggs results in easier digestibility than either hard boiled or raw eggs. The raw white well beaten is also easily digested. The whole egg and hard boiled eggs are probably the most resistant to digestion. The only advantage in the taking of raw egg would be in connection with the egg albumin, which when given alone can be utilized in large amounts. There is an old practice among certain physicians of allowing ulcer patients to have a hard boiled egg at their bedside during sleep in case they are awakened by pain. A well masticated bite of the egg is supposed to relieve the pain.

## SIMPSON MODIFICATION OF GILLIAM OPERATION FOR RETROVERSION

*To the Editor:*—Kindly inform me as to the steps of the Simpson modification of the Gilliam operation for retroverted uterus.

EUGENE C. LOWE, M.D., Miami, Fla.

ANSWER.—After the peritoneal cavity has been opened, a ligature is passed about each round ligament about 1½ inches from the uterus, the ends of the ligatures being left long. Each is now separately threaded into a large pedicle needle and led through a small opening in the anterior surface of the broad ligament anterior to and just below the point where the ligature is located. By means of the pedicle needle, the ligature is carried between the leaves of the broad ligament and along the anterior abdominal wall just under the peritoneum until near the outer edge of the rectus abdominis muscle. Simpson then threaded the ligature on a full curved needle and carried it back into the peritoneal cavity, catching peritoneum, muscle and fascia, whereas Montgomery modified the procedure by carrying the ligature, and after it the round ligament, through the aponeurosis of the abdominal wall and fastened it there with chromic catgut.

## WASSERMANN FAST SYPHILIS

*To the Editor:*—Recently I have had a patient under antisyphilitic treatment, a woman, aged 28, who had a chancre of the tongue when 6 years old. She has been treated since that time with arsenic, iodides and mercury and has always had a four plus Wassermann reaction. During this period of treatment she has had two rest periods of two years each. At the present time she has no superficial veins that can be used. Will you kindly advise me as to what form of treatment to use in this case and what I may expect from such treatment? Kindly omit name.

M.D., Oklahoma.

ANSWER.—It is apparent that this patient belongs to the so-called Wassermann fast type and that it would not be advisable to attempt to bring about a reversal of the positive Wassermann test by too intensive treatment. Intermittent medication with iodides by mouth and once or twice yearly a course of eight or ten injections of one of the standard bismuth or mercury preparations or sulpharsphenamine bismuth intramuscularly should be sufficient, provided there is no involvement of the central nervous system or of the cardiovascular mechanism. A serologic cure can hardly be expected in a long standing Wassermann positive case. A temporary reversal of the serologic reaction might be brought about by fever therapy.

## DEATH FROM LIGHTNING, SUNSTROKE OR ANGINA PECTORIS

*To the Editor:*—A man, aged 41, apparently in good health, who had been shocking wheat, was found dead. His ears, neck and shoulders were mottled with apparent hemorrhages or stains of blood under the skin. The lips were blue. There was a cut on the back of the head, evidently from a fall. There was no evidence of fracture. The fingers were not clenched. There was no distortion in the face. The shirt was torn in back; his wife said that it was not torn before or at least when he put it on in the morning. The skin was mottled over the body in occasional spots similar to those on the ears, neck and shoulders. Was this man struck by lightning, as his people believe, or was it a coronary thrombosis? There were no evidences of a burn anywhere on his body. There were no trees in the vicinity. Please omit name.

M.D., Ohio.

ANSWER.—In some cases of death from lightning, no definite lesions have been found. In others there have been only small bluish or reddish spots and small hemorrhagic extravasations in the skin. There consequently is no reason at hand that could justify one in denying that death may have been caused by lightning. Appearances like those described are seen also in cases of death from sunstroke. It goes without saying that no opinion of any value may be ventured with respect to the suggestion that death may have been due to angina pectoris in the case in question.

### MOLDY FOOD IN FOOD POISONING

*To the Editor:*—Are there any known evil effects of eating moldy food?

E. L. DAVIS, M.D., Kijabe, Kenya Colony, East Africa.

ANSWER.—Moldy food has never been definitely implicated as a cause of food poisoning; that is, the products of the common molds (Penicillium, Mucor, Aspergillus) are not known to be toxic when swallowed. As is well known, certain species of Penicillium are habitually used for ripening Brie, Camembert and Roquefort cheese. Thom and Church (The Aspergilli, Baltimore, 1926, p. 89) cite experiments by Quevedo in South America made with a species of Aspergillus (A. maydis), which was thought by Quevedo to generate products toxic for horses and rabbits, but they add the comment: "The organism has not since been identified or studied in the light of more recent researches of forage poisoning. Until such repetition is possible, the results must now be regarded as questionable." The same authors also refer to more recent experiments in the Bureau of Chemistry, Washington, in which it was shown that grain inoculated with various species of Aspergillus and fed to horses and sheep over periods of from four to six weeks "failed to show evidence of toxicity itself or of infectivity due to the spores which filled the air which the animal breathed."

### FACIAL TIC IN DOGS

*To the Editor:*—Our pet dog, on the day following contact with another dog that has had a unilateral facial tic for almost a year, developed a unilateral facial tic, which has persisted. Its onset was associated with a conjunctivitis of the eye of the same side of the face as the tic. Does there exist a contagious condition among dogs of this kind? If it is contagious, could human beings acquire it by close contact with such diseased dogs?

JACOB A. RIESE, M.D., West New York, N. J.

ANSWER.—Friedberger and Frohner, in their "Infective Diseases of Animals," make no mention of facial tic in dogs, nor does Moore in his "Pathology of Infectious Diseases of Animals." Medical literature does not contain any definite records of transfer from dog to man of any such condition as mentioned in the question.

### USES OF YEAST

*To the Editor:*—Please advise me as to proper indications for the use of yeast, other than in the prevention and treatment of pellagra. What intestinal and skin diseases are benefited by its use? What contraindications exist? What are the differences in the effect of fresh yeast cakes and dried brewers' yeast? The popular mass advertising has caused much uncontrolled use of yeast. Please omit name and address.

M.D., Alabama.

ANSWER.—Aside from its value in vitamin deficiency and as a laxative, no other indications are definitely established. Its action in acne and furunculosis is so irregular as to be unpredictable. No contraindications have thus far been elaborated. There is no essential difference between the two forms of yeast mentioned.

### SPECIFIC SENSITIVITY

*To the Editor:*—An unmarried school teacher, aged 40, comes to this locality each year and spends the summer. She complains that every summer, shortly after arriving, her face develops an intense itching and redness. She uses no soap or water on her face. The creams she uses were used before she came into the locality and caused no reaction. Her diet is not changed. She comes from Oregon, where redwoods and pines are common, to this locality where we have an abundance of oaks. In fact, a good part of the time she spends at a nearby farm where there are many oak trees. Physical examination, except for the diffuse maculopapular erythema of the face and a few papules on the outer aspects of both arms, is negative. Please suggest diagnosis and treatment. Please omit name.

M.D., Illinois.

ANSWER.—The problem here is not a simple one. It is apparent that the skin lesion is due either to external contact or to some food which the patient eats only in the summertime. The latter possibility can be readily ruled out by having the patient avoid such foods as corn, berries, cantaloup, watermelon and peaches. Contact dermatitis is more difficult to handle. The condition may be due to contact with some vegetation, as oak, primrose, grass or ragweed. Cases due to crysanthemum, tulip and others have been reported. It may also be due to contact with other substances, such as cosmetics, hair washes, lotions or furs. For contact dermatitis, the best method of determination is the contact or patch test, whereby the leaves or other substances to be tested are moistened and placed on a small square of gauze, applied to the back, covered with oiled silk, and held by two strips of adhesive plaster. If, when examined at the end of twenty-four, forty-eight or seventy-two hours, the areas show any redness, itching, or formation of vesicles, the reaction is considered positive. Many tests may be done at the same time.

To test for foods, the usual protein sensitization tests are indicated. They may give results or may fail. In any case they are to be checked by proper food elimination diets.

### TREATMENT OF PULLED SHOULDER OR TRAUMA TO SHOULDER JOINT

*To the Editor:*—I have a patient, a girl, aged 12 years. Three or four years ago while in America she was crossing the street with her mother. An automobile had just passed and they did not see the oncoming car until right in front of it. To save her daughter the mother grabbed the girl by her left arm and threw her back out of the way of the car, which did, however, just strike her foot. The sudden strain on her arm so strained the ligaments that she feels her arm get out of place somewhat whenever she lifts or carries something a little heavy with that left arm. By pulling, the arm can be pulled out of its normal position for about an inch. What treatment would you suggest for the case?

E. L. DAVIS, M.D., Kijabe, Kenya Colony, East Africa.

ANSWER.—The mother undoubtedly produced considerable trauma to the capsule of the shoulder joint, and possibly the circumflex nerve. This case corresponds with a subluxation almost like a mild, recurrent dislocation to the shoulder. It is sometimes spoken of as "pulled" shoulder. Some of these cases result in "snapping" shoulder.

In some of these cases the capsule of the shoulder joint is relaxed similarly to the condition seen in cases of poliomyelitis.

Recommendations include massage, contrast sprays, electrical stimulation, exercises, support for the shoulder to relieve gravity pull, and capsuloplasty, including imbrication of the capsule or quilting of the capsule.

In severe cases, suspension operations are indicated such as those described by Nicola and by Henderson.

### FRACTURE OF CLAVICLE

*To the Editor:*—I have a patient who had a fracture of the right clavicle, the middle third. A T splint was applied for fourteen days, and then a figure-of-eight bandage. The union is good. However, a droop of the right shoulder developed. The callus is prominent. What is the prognosis? Will the callus be partly or totally absorbed? Kindly omit name.

M.D., Ohio.

ANSWER.—The callus will undoubtedly absorb sufficiently to preclude the necessity of operation. The droop of the shoulder is probably due to the traction on the brachial plexus caused by the weight of the arm. In most cases this can be avoided by wearing a sling for a few days in addition to the T splint.

### BEDBUG INFESTATION

*To the Editor:*—Our Rod and Gun Club has a camp cabin infested with bedbugs. It is lined with tongue and grooved lumber but cannot be made air tight for fumigation. What is the best insecticide to use? When the clubhouse is closed this fall would it do any good to fumigate with cyanide gas? Any suggestions and plan for use would be greatly appreciated. Would you please answer at once? Please omit name.

M.D., Utah.

ANSWER.—Bedbug infestation in a camp cabin that is reasonably tight can be controlled, if not eradicated, by fumigation with hydrocyanic acid gas. Write the Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C., for Farmers' Bulletin 1670, which contains information as to procedure.

### "JELLYFISH AND STINGING NETTLES"

*To the Editor:*—In the April 9 issue of THE JOURNAL, a question was asked regarding treatment of the bites of jellyfish, or so-called Portuguese man-of-war. My experience in the South is that the Portuguese man-of-war is a balloon-shaped blue fish, the balloon apparently filled with air, with long tentacles about the size of twine and varying from 1 to 2 or 3 feet long. These tentacles in the water come in contact with a person and adhere to the skin, even wrapping around the arm or leg. Apparently there is an oil on these tentacles which, when it strikes the skin, causes excruciating pain and the part affected can readily be mapped out with welts where the tentacles have become attached. The best treatment I have found for this is, considering it an oil, immediate washing with any cleaning fluid or gasoline to dissolve the oil, then thorough scrubbng with any harsh soap, and then application of any lotion, such as calamine, to allay irritation of the skin. This is painful until the oil is washed from the skin; then the local irritation subsides in about a day.

There is a peculiar rash which appears on bathers at different times during the month of February and March in Southern waters, which has been attributed to the spawn of jellyfish; but as yet I have never known a jellyfish of the ordinary sort to bite. This skin irritation is treated locally by application of some skin lotion.

CHARLES C. MORRISON, JR., M.D., Bar Harbor, Maine.

# Council on Medical Education and Hospitals

## COMING EXAMINATIONS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: The examination will be held in nineteen different cities in the United States and Canada, Oct. 22. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

ARIZONA: Phoenix, Oct. 3. Acting Sec., Dr. Jos. M. Greer, Professional Bldg., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, Sept. 21. *Regular.* Sacramento, Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 4. Sec., Dr. William Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 8. Prerequisite to license examination. Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

IDAHO: Boise, Oct. 4. Dir., Bureau of License, Mr. F. L. Cruikshank, Boise.

ILLINOIS: Chicago, Oct. 18-20. Supt. of Registration, Mr. Paul B. Johnson, Springfield.

MICHIGAN: Lansing, Oct. 11-13. Sec., Dr. Nelson McLaughlin, 1010 Maccabee Bldg., Detroit.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 4-5. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Oct. 18-20. Sec., Dr. E. J. Engberg, 524 Lowry Medical Arts Bldg., St. Paul.

MONTANA: Helena, Oct. 4. Sec., Dr. S. A. Cooney, Power Block, Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 4-5. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW JERSEY: Trenton, Oct. 18-19. Sec., Dr. James J. McGuire, 1101 Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 10-11. Sec., Dr. P. G. Cornish, Jr., 221 W. Central Ave., Albuquerque.

TENNESSEE: Memphis, Sept. 29-30. Sec., Dr. Alfred B. DeLoach, Medical Arts Bldg., Memphis.

WYOMING: Cheyenne, Oct. 3. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

### Vermont June Report

Dr. W. Scott Nay, secretary, Vermont State Board of Medical Registration, reports the written examination held in Burlington, June 22-24, 1932. The examination covered 12 subjects and included 90 questions. An average of 75 per cent was required to pass. Twenty candidates were examined, all of whom passed. The following colleges were represented:

| PASSED | Year Grad. | Per Cent |
|---|---|---|
| Tufts College Medical School | (1932) | 83.2 |
| University of Vermont College of Medicine (1931) 79.4, 85.7, (1932) 83.6, 84.5, 85.3, 86.3, 86.5, 87.3, 87.6, 87.8, 88.1, 88.4, 88.4, 88.7, 88.7, 90.1.* | (1930) | 78, |

Dr. Nay also reports 7 physicians licensed by endorsement from April 14 to July 20, 1932. The following colleges were represented:

| LICENSED BY ENDORSEMENT | Year Grad. | Endorsement of |
|---|---|---|
| State University of Iowa College of Medicine | (1929) | Iowa |
| University of Maryland School of Medicine | (1912) | Maryland |
| Tufts College Medical School | (1904) | New Hamp. |
| Fordham University School of Medicine | (1917) | New York |
| Queen's University Faculty of Medicine | (1924) | Idaho |
| McGill University Faculty of Medicine | (1917) | Canada |
| Licentiate of the Royal College of Physicians and Surgeons, Edinburgh, and Royal Faculty of Physicians and Surgeons of Glasgow | (1931) | Scotland |

* No grade reported. License being withheld.

### Kentucky June Report

Dr. A. T. McCormack, secretary, Kentucky State Board of Health, reports the written examination held in Louisville, June 8-10, 1932. The examination covered 11 subjects and included 110 questions. Sixty-four candidates were examined, all of whom passed. The following colleges were represented:

| PASSED | Year Grad. | Per Cent |
|---|---|---|
| University of Arkansas School of Medicine | (1932) | 81 |
| Loyola University School of Medicine | (1932) | 85 |
| University of Louisville School of Medicine (1932) 79, 80, 82, 82, 82, 83, 83, 83, 83, 83, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 87, 87, 87, 87, 87, 87, 87, 87, 87, 87,* 88, 88, 88, 88, 88, 88, 88, 88, 89, 89, 89, 90, 91, 91, 91, 91, 92 | (1931) | 88, |
| Creighton University School of Medicine | (1932) | 79, 83 |
| University of Cincinnati College of Medicine | (1932) | 87,† 88 † |
| University of Oklahoma School of Medicine | (1932) | 85 |
| Hahnemann Medical Coll. and Hosp. of Philadelphia | (1931) | 82 |
| University of Pennsylvania School of Medicine | (1931) | 83 |
| University of Tennessee College of Medicine | (1932) | 85 |

Dr. McCormack also reports 5 physicians licensed by reciprocity with other states and 2 physicians licensed by endorsement from July 2 to Aug. 10, 1932. The following colleges were represented:

| LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|
| University of Arkansas School of Medicine | (1930) | Louisiana |
| Emory University School of Medicine | (1931) | W. Virginia |
| State University of Iowa College of Medicine | (1911) | Iowa |
| Creighton University School of Medicine | (1931) | Ohio |
| University of Cincinnati College of Medicine | (1932) | Ohio |

| LICENSED BY ENDORSEMENT | Year Grad. | Endorsement of |
|---|---|---|
| University of Louisville School of Med. | (1925), (1931) | N. B. M. Ex. |

* Diploma withheld.

† These applicants have received an M.B. degree and will receive an M.D. degree on completion of an internship.

### District of Columbia July Report

Dr. W. C. Fowler, secretary, Commission on Licensure, District of Columbia, reports the written examination held in Washington, July 11-12, 1932. Twenty-eight candidates were examined, 27 of whom passed and one failed. The following colleges were represented:

| PASSED | Year Grad. | Number Passed |
|---|---|---|
| College of Medical Evangelists | (1932) | 1 |
| Georgetown University School of Medicine | (1931, 5) | 5 |
| George Washington University School of Medicine | (1931, 12) | 12 |
| Howard University College of Medicine | (1931, 2) | 2 |
| Northwestern University Medical School | (1906), (1931) | 2 |
| Rush Medical College | (1922) | 1 |
| University of Illinois College of Medicine | (1932) | 1 |
| University of Virginia Department of Medicine | (1930) | 1 |
| Royal Hungarian University Faculty of Medicine, Budapest | (1915),* (1925) | 2 |

| FAILED | Year Grad. | Number Failed |
|---|---|---|
| Georgetown University School of Medicine | (1930) | 1 |

Dr. Fowler also reports 11 physicians licensed by reciprocity with other states from Jan. 14 to July 18, 1932. The following colleges were represented:

| LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|
| Georgetown University School of Medicine | (1908) | Connecticut |
| George Washington University School of Medicine (1930) Maryland | (1928) | New York, |
| Howard University School of Medicine | (1929) | N. Carolina |
| Johns Hopkins University School of Medicine | (1902) | Maryland |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1929), (1930) | Maryland |
| University of Buffalo School of Medicine | (1923) | New York |
| Medical College of Virginia | (1929) | Virginia |
| University of Virginia Department of Med. | (1907), (1924) | Virginia |

* Verification of graduation in process.

### Alabama July Report

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports the written examination held in Montgomery, July 11, 1932. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. The following colleges were represented:

| PASSED | Year Grad. | Per Cent |
|---|---|---|
| University of Arkansas School of Medicine | (1931) | 83.7 |
| Rush Medical College | (1932) 85.5,* | 87.3* |
| University of Louisville School of Medicine | (1931) | 85.8 |
| Tulane University of Louisiana School of Medicine 86.5, 86.8, 88.2 | (1932) | 85.1, |
| University of Tennessee College of Medicine | (1932) | 84.4 |
| Vanderbilt University School of Medicine | (1932) | 88.6 |

Dr. Baker also reports 7 physicians licensed by reciprocity with other states and one physician licensed by endorsement from Jan. 21 to July 12, 1932. The following colleges were represented:

| LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|
| Emory University School of Medicine | (1931) | Georgia |
| Rush Medical College | (1930) | Illinois |
| University of Minnesota Medical School | (1929) | Minnesota |
| Meharry Medical College | (1928) | Tennessee |
| Baylor University College of Medicine | (1930) | Louisiana |
| University of Virginia Department of Medicine | (1928) | Virginia |
| University of Naples Faculty of Med. and Surgery | (1923) | Illinois |

| LICENSED BY ENDORSEMENT | Year Grad. | Endorsement of |
|---|---|---|
| Harvard University Medical School | (1929) | N. B. M. Ex. |

* These applicants have received their four-year certificate and will receive their M.D. degree on completion of an internship.

# Book Notices

**Epidemiologische en bacteriologische gegevens over het roodvonk.** Door Dr. J. Goudsmit. Bekroond antwoord op de prijsvraag uitgeschreven door de Nederlandsche Maatschappij tot Bevordering der Geneeskunst. Cloth. Pp. 311, with illustrations. Amsterdam: F. Van Rossen, 1932.

This work is the prize winning answer to the following thesis propounded by the Dutch Society for the Advancement of Medicine at Amsterdam: "Data, partly based on personal observations, are requested concerning the epidemiology of scarlet fever, taking into consideration the question of contagion by inanimate objects and making use of the modern reactions of immunity." The author devotes the first part of his work to a review of the literature on the etiology and pathogenesis of scarlet fever, with especial reference to Streptococcus hemolyticus, Dick's toxin and the meaning of Dick's immunity reaction. In the second part he deals with transmission of the disease through the various known agencies and from the point of view of the streptococcus theory. In the third part he discusses from the endemic point of view (1) the influence of the factors of age, race, sex, season, and the like, on the incidence of scarlet fever, taking for granted that Dick's reaction furnishes an index of the susceptibility to the disease; (2) the relations between virus, individual and group, with especial reference to the streptococcus as the causative agent, and (3) the application of the previously obtained data. In the fourth part he treats of scarlet fever epidemics, describes their changeable course and attempts to explain it from the point of view of our actual knowledge of surrounding conditions. The fifth part deals shortly with prophylactic and therapeutic measures. The author concludes his work with the statement that his investigations do not allow him to declare himself decisively for or against the streptococcus theory of scarlet fever. The book is carefully planned, well subdivided and connected and gives the reader a clear understanding of the subject under consideration.

**Habits for Safety: A Text-Book for Schools.** By Harry W. Gentles, of First Aid Life Saving, Chicago Chapter American Red Cross, and George H. Betts, Director of Educational Research, Northwestern University. Cloth. Price, 67 cents. Pp. 228, with illustrations. Indianapolis: Bobbs-Merrill Company, 1932.

These authors are particularly well equipped to prepare this type of book. Dr. Gentles is chairman of first aid life saving for the Chicago chapter of the American Red Cross and Mr. Betts is director of educational research in Northwestern University. It is becoming generally recognized that death by accident accounts for 100,000 lives annually. There are, moreover, some 10,000,000 injuries with a loss of billions of dollars due to absence from work and payment of compensation. The handbook called "Habits for Safety" is planned particularly for the young, since it is in youth that habits of safety must be developed. Various chapters in this book deal with safety in the home, at school, on the street, on the farm and in play. There are also chapters on the prevention of fires and electrical accidents, on the safety of the worker and on the administration of first aid.

**Beiträge zur Physiologie des Hirnstammes.** Von Prof. Dr. W. R. Hess, Direktor des Physiologischen Institutes der Universität Zürich. Teil 1: Die Methodik der lokalisierten Reizung und Ausschaltung subkortikaler Hirnabschnitte. Von Prof. Dr. W. R. Hess. Paper. Price, 24 marks. Pp. 122, with 114 illustrations. Leipzig: Georg Thieme, 1932.

This volume represents the first part of a series of contributions to the physiology of the brain stem and contains the description of the experimental method of the author. A cat is anesthetized by nitrous oxide and placed on the operating table; electrodes are then mounted on its head by means of special electrode holders, which are screwed on the skull. Electrodes with two or more poles have been used, each pole carrying two needles; they are inserted into the brain stem through small burr holes, and the brain is stimulated electrically after the animal has recovered from the anesthetic. Half an hour after the experiment, which is always photographed by a cine-camera, the cat is killed and the brain fixed by solution of formaldehyde. After twenty-four hours the electrodes are removed and the part of the brain containing the stimulated points is used for histologic purposes. Every area affected by the points of the electrodes is indicated by figures on enlarged photomicrographs, which are taken from serial sections. The whole set of these sections represents the "atlas of stimulated points." Every effect that has been observed during the experiments is registered in the so-called directory of symptoms, together with a description of the way it has been obtained. The information gathered by the stimulation experiments is completed by a series of experiments during which a coagulating current is introduced into the brain stem, so as to destroy certain points. The volume contains an extraordinarily detailed and elaborate description of every step of the experimental procedure, and of the various pieces of apparatus. A knowledge of the method used by the author is of great value for any one who is occupied in experimental neurology.

**A Short Introduction to the History of Human Stupidity.** By Walter B. Pitkin. Cloth. Price, $3.50. Pp. 574. New York: Simon & Schuster, 1932.

After Sinclair Lewis wrote "Babbitt," he pointed out that even the best of us are Babbitts and that even the smartest man may have Babbitt characteristics. Professor Pitkin has made a survey of stupidity among the great, among nations and races, indeed, such a massive array of stupidity in general as to convince the reader that stupidity is everywhere and that one is warranted in indicting Professor Pitkin for stupidity for making so much of stupidity. One need not search far to understand why human beings are stupid. It is simply because they are human beings.

**Division palatine, anatomie, chirurgie, phonétique.** Par Victor Veau, chirurgien de l'Hôpital des Enfants Assistés. Avec la collaboration de Mlle. S. Borel. Paper. Price, 140 francs. Pp. 568, with 786 illustrations. Paris: Masson & Cie, 1931.

This book presents the experience of the author in doing 500 cleft palate operations. From the introduction one feels that he has made the best of his experience and has set down his voluminous observations in a frank manner that stimulates the reader in the study and, more than that, wins him to the spirit of the author.

The book is divided into three parts: Anatomy constitutes the first part. Four types of cleft are distinguished: (1) simple cleft of the soft palate, 20.8 per cent; (2) simple cleft of the soft and hard palate without harelip and with the alveolus intact, 30.8 per cent; (3) unilateral cleft palate with the alveolus cleft, 38.8 per cent; (4) bilateral cleft palate with complete isolation of the median tubercle, 9.6 per cent. Surgical anatomy of all component structures is discussed at length and with many illustrations, and, following these studies, the author has outlined operations for as close as possible anatomic restorations.

The second part deals with the surgery of cleft palate. The methods of others are discussed at some length, and several pages are occupied with Lexer's ideas on the subject, which are generally adverse to those of the author. There is apparently a complete list of methods proposed for closing the palate where classic methods fail, and there is a list of "monstruosités chirurgicales" which includes operations to close the defect with flaps brought in from elsewhere in the body. The bad results of operation and reasons for them by the classic methods are discussed from anatomic and functional standpoints. There now follow case reports of the 500 operations. These range in length from half a line to several pages, and there are numerous illustrations, mostly line drawings of operations. In this section almost any type of cleft is to be found with a description of the author's closure. Statistics from all angles are listed. The total mortality has been 3.8 per cent (19 deaths out of 500), and it is interesting to note the decreasing mortality with the increase in years: one year, 9.4 per cent; two years, 5.7 per cent, three years, 2.7 per cent; four years, 1.8 per cent. Under the heading of statistics comes the discussion concerning the age at which the operation should be done. The author's ideas might be said to be reduced to mathematical accuracy. One who is in a quandary over this point must surely find solace in this small section. 1. The mortality is an argument in favor of late operation. 2. The speech is an argument in favor of early operation. It is shown that, in children operated on in the first year, speech is 70 per cent normal; in the second year, 69 per cent; but in the third year, 26 per cent. The optimal age for closing a cleft palate is between the twelfth and the twenty-fourth month; the mortality is 5.7 per cent, and the speech function is 69.6 per cent. However, these total

statistics may be presented to the parents and the decision made by them. Veau agrees with Berry that the occasional operator had best wait for the later age. The statistics on anatomic closure show 15 unclosed palates, 26 holes behind the alveolus and 24 holes at the junction of the hard and soft palate.

The third part is said by the author to be the main aim of the book and deals with his technic for the closure of the four forms originally distinguished. In the first type, simple cleft of the velum, closure is effected by sutures along the nasal and buccal surface and a wire around the muscle bundle. No lateral incisions are made. The steps are made clear by twenty-eight illustrations. In the second type, cleft palate without cleft lip or alveolus, closure similar to the first type is done, but lateral flaps are raised over the hard palate and switched toward the median line. In the third type, complete cleft with harelip, a flap is taken from the vomer and turned over on itself to make a nasal lining, a palate flap from the cleft side is raised and carried over to the under surface of the vomer flap and held there apparently with one suture, and the vomer flap is then closed entirely through the alveolus with a flap turned similarly from the nasal, alveolar and buccal fornix mucosa. The soft palate is closed at another operation. For the fourth type, bilateral cleft palate and lip, essentially the same process is carried out as that in the third type, except that there are flaps taken from both sides of the vomer. Only one illustration accompanies this type of closure, and the author states that he writes this chapter with timidity because he has not had sufficient experience to state with authority the value of the method he proposes. The final chapters, on speech, include studies by Mlle. Borel on the physiology of speech in patients with cleft palate, and on the training of speech after operation.

The book stands as a monumental work to the author. There is such volume to it that it may be taken as a standard reference on the subject. The bibliography is excellent and, furthermore, is referred to generally in the text. Cleft palate will be found to be a complicated surgical problem; thorough study of the book might discourage some from attempting the work, but no one who does the work should omit a thorough study of it.

**Man and Medicine: An Introduction to Medical Knowledge.** By Dr. Henry E. Sigerist, Professor at the University of Leipzig. Introduction by Dr. William H. Welch, Professor of the History of Medicine, the Johns Hopkins University. Translated by Margaret Galt Boise. Cloth. Price, $4. Pp. 346. New York: W. W. Norton & Company, Inc., 1932.

Professor Sigerist has just taken the chair of the history of medicine in Johns Hopkins University. The book here presented has had a remarkable success in Germany, where there would appear to be a far greater number of intelligent laymen interested in medical knowledge than in this country. The book is divided roughly into parts dealing with man, disease, medical aid and the physician. It presents not only an outline history of medicine, written in exceptionally good English, but also a philosophy of medicine and a vast amount of fundamental medical knowledge. It is hard to believe that any person could be considered well educated without the information that Professor Sigerist here makes available. The layman who wishes a better understanding of current trends in medicine will find in this book the orientation that he desires.

**Produktive Diabetikerfürsorge.** Von Prof. Dr. Alfred Lublin und Dr. Robert Kroner, Assistenten der Medizin. Universitätsklinik und Poliklinik, Greifswald. Ein Bericht über Ziele und Erfahrungen des ersten deutschen Diabetikerheimes in Garz auf Rügen. Mit einem Geleitwort von Prof. Dr. Gerhardt Katsch, Direktor der Medizin. Universitätsklinik und Poliklinik, Greifswald. Paper. Price, 6 marks. Pp. 92. Leipzig: Georg Thieme, 1932.

This booklet gives the results of a year's experience with more than 200 patients in a newly erected German institution. This first German diabetic home was built for the purpose of aiding diabetic patients during the present economic conditions in Germany with a minimum of expense and an optimum of results. Much stress was laid on the fact that diabetic patients are unable to find work in the days of unemployment of millions of healthy people and therefore suffer from an inferiority complex in view of their own physical illness. Every effort was made to find some kind of occupation for every patient. The type of work depended on the stage of the disease and on the patient's previous education and experience. Thus a happy mental equilibrium was created which was thought to be of great importance for a successful diabetic treatment. The patients worked in the offices, laboratories, kitchens, the garden and the farm of the institution. In fact, all the employees of the home have diabetes. Their work was satisfactory throughout.

The main purpose of the medical treatment was to find the optimum in the carbohydrate tolerance, not while the patient was inactive but while in the routine of moderate physical exercise and work. The average duration of treatment of patients with mild and moderately severe diabetes was 32 days and in severe instances 132 days. No death was reported. The authors' experiences regarding the physical activities of their patients are summarized in their statement that neither the carbohydrate metabolic disturbance nor the general condition in a single patient showed any turn for the worse. However, an improvement of the carbohydrate tolerance that could be interpreted as being due to muscular activity was not observed. This is in contradistinction to the researches of Buerger and others, who reported favorable results in patients who were treated with insulin and who were kept at voluntary muscular activity. The authors emphasize the favorable effects of a diet poor in fat and rich in protein and carbohydrate as recommended by Porges and Adlersberg in cases of severe carbohydrate disturbances. The booklet is comprehensive and contains many valuable and concise statements. It may be recommended to any one interested in the modern treatment of diabetic patients.

**Protective Measures Against Dangers Resulting From the Use of Radium, Roentgen and Ultra-Violet Rays.** By Professor Hermann Wintz, M.D., Ph.D., Director of the University Gynæcological Clinic and Roentgen Institute, Erlangen. With the Assistance of Privatdozent Walther Rump, Ph.D. League of Nations, Health Organisation. Series of League of Nations Publications, III. Health. 1931. III. 9. Official No.: C. H. 1054. Paper. Price, 75 cents; 3/-. Pp. 114. Boston: World Peace Foundation; Geneva: League of Nations, 1931.

The chapters in this book concern prevention against dangers caused by radiation and against electrical accidents. They also cover hygienic measures in radiation establishments, and measures against the dangers of x-ray fires. Obviously the prevention of harm from the x-rays is concerned largely with dosage and with the use of suitable screens. A complete bibliography is offered as a supplement to the volume.

In considering the disasters that have resulted and the dangers that have developed due to storage of x-ray films, Professor Wintz points out that compliance with some of the regulations is practically impossible. He feels that the regulations issued by the German ministry of the interior, providing that fireproof safes be used for storage, so far as small stores of up to 15,000 films are concerned, are quite sufficient. He feels also that more importance should be attached to proper handling of x-ray films, for a small quantity of film, incautiously handled, is just as capable of causing a dangerous fire as a larger quantity.

**Plastic Surgery of the Nose, Ear and Face.** By Dr. Victor Frühwald. Translated by Geoffrey Morey, M.B., B.S., D.L.O., Junior Surgeon Shropshire Nose, Ear and Eye Hospital (Shrewsbury). Cloth. Price, $4. Pp. 86, with 88 illustrations. Vienna: Wilhelm Maudrich, 1932.

This is a short book written mainly for doctors who have worked with the author. It includes cosmetic surgery of the nose and ear and technic for the removal of wrinkles and folds from the face. The rasp is used to remove bony nasal humps, and ivory implants are recommended for saddle nose. The author has listed the deformities that he believes are the most commonly encountered, such as small hump nose, large hump nose, wide nose, saddle nose, alar deformities, large ears, prominent ears, and wrinkles of the face. For each of these there is a description of the author's technic of operation, and credit is given other surgeons when their methods are used. The author has not published any "before and after" photographs because he believes they are of no particular use to the reader.

**Report of the Permanent Commission on Biological Standardisation (London, June 23rd, 1931).** League of Nations, Health Organisation. Series of League of Nations Publications, III. Health, 1931. III. 10. Official No.: C. H. 1056 (I). Paper. Price, 40 cents; 1/6. Pp. 78. Boston: World Peace Foundation; Geneva: League of Nations, 1931.

This pamphlet is concerned with the standards adapted in various parts of the world for antitoxin, tuberculins, serums, biologic products for veterinary use, sex hormones and vitamins. It makes available the vitamin standards developed at the meeting in London in June, 1931.

# Medicolegal

## Malpractice Suit No Bar to Subsequent Action on Contract to Cure

*(McQuaid v. Michou (N. H.), 157 Atl. 881)*

The plaintiff brought an action for damages against the defendant-physician, charging him with negligence in treating her. There was a judgment in favor of the physician. Thereafter, the plaintiff brought another action against the physician, charging him with a breach of an express contract to cure. From a verdict for the plaintiff, the physician brought exceptions to the Supreme Court of New Hampshire.

The present suit is not barred, said the Supreme Court, because the existence of a promise to cure may have been an issue in the prior suit. If it was an issue, it was only a collateral one, not essential as an element of the cause of action. The prior suit was for improper treatment. This action is for failure of a promised result of treatment. The physician's liability in this action depends, continued the court, not on the character of his conduct but on his agreement for its results. How he acted is now only of collateral bearing, while in the prior suit it was only of collateral bearing what he agreed to do. The verdict in the prior suit shows that the physician's treatment of the plaintiff was proper and skilful, but it does not show what his undertaking was as to the outcome of the treatment. The fact that in the prior suit the plaintiff based her claim on improper treatment does not bar her present claim of proper treatment barren of promised results. While the plaintiff in this action may not find fault with the treatment she received, she may say that it did not do for her what the physician promised. If the physician had promised to pay the plaintiff a stipulated amount if he did not cure her, the defense that he had used due care and skill would be of no avail. The contract here falls short of such a promise only in its deficiency of provision for liquidated damages.

Apparently, the plaintiff did not complete the full course of treatments the physician wished to give. This conduct on the part of the patient, the physician claimed, was a breach of the contract on her part. The evidence, said the court, authorized a conclusion that the plaintiff did not complete the treatment because it affected her health too seriously. The physician contended that the verdict in the prior suit determined this issue of her fault against her. The verdict in the prior suit, said the court, exonerated the physician from blame for the treatment, but it did not show that the plaintiff was at fault for the results of the treatment. Responsibility for the results was not necessarily hers merely because it was not the physician's. A contract to cure is against public policy, the physician further contended, in that its enforcement would tend to dissuade a physician from encouraging his patients by giving them hope as an important aid to their improvement or recovery. The line between a promise and an opinion, said the court, is not so narrow and shadowy that language may not be well chosen to express one in clear distinction from the other. It is a simple matter for a physician to make it definite that he guarantees no good results. If a promise to cure were held illegal, a patient ignorant of its illegality would be misled in placing reliance on it. If he were aware of its lack of binding force, his knowledge would tend to prevent confidence in it, and the gain to be expected from freedom of statement would be lost in its known irresponsibility.

The trial court declined to charge the jury, at the physician's request, that the plaintiff could not recover unless she believed that the defendant would cure her, or if both parties knew her disease to be incurable. Expectation on the plaintiff's part, said the court, that the promise to cure would be fulfilled, was not necessary to give it contractual effect. When a thing is promised, it is of no consequence whether or not the promisee expects performance. If both parties knew the disease was incurable, however, then they knew that the promise could not be performed. Contracts known by the contracting parties to be impossible of performance are void and the jury should have been so instructed. If, however, the terms of the contract limited the duration and severity of the treatment, the plaintiff may recover damages for any conditions or results of the treatment in excess of the limits, although both parties knew the disease was incurable. If the plaintiff knew she could not be cured, she took the treatment with some thought that it might help her. If it hurt her beyond what it was agreed it would, and if she incurred expense and loss of earnings on that account, she may claim a breach of the terms of the agreement in regard thereto, even if the knowledge of both parties that she could not be cured made the promise to cure ineffective.

The rule of damages, said the court, in a suit alleging breach of contract to cure, gives as compensation only the difference between the condition promised and the actual condition, including incidental consequences fairly subject to contemplation by the parties when the contract is made. The actual condition may include suffering as an attendant feature of it, and hence such suffering may be shown. Suffering, however, incident to treatment may not be taken into consideration in the computation of damages. For error of the trial court in instructing the jury concerning the measure of damages, the Supreme Court overruled the verdict for the plaintiff and remanded the case for a new trial.

**Unlawful Practice of Medicine by Chiropractor.**—Robertus, a chiropractor, treated a patient, after examination, "for misalignment of certain joints of the vertebrae and spine." He used no drugs nor surgical instruments. He was convicted of practicing medicine without a license and appealed to the court of criminal appeals of Texas. The medical practice act of Texas, said the appellate court, has often been held constitutional. In *Hicks* v. *State*, 88 Texas Cr. R. 438, 227 S. W. 302, the court said:

> The law as a law appears to be made equally for all who fairly come within its comprehension, and, as far as we know, prescribes no examination conforming to the technical requirements of any school or branch of medical practice, and is not violative of the tenets of article 16, section 31, of our constitution, which commands laws prescribing the qualifications of physicians, and forbids preference by law to any school of medicine.

The trial court did not err in permitting a witness to testify, over objection, concerning the number of her visits to Robertus' office for treatment. Neither did the court err in refusing to permit a patient of Robertus to state what her condition was after she had been treated by him. Such evidence, said the appellate court, could in no way mitigate against the question of guilt. The trial court refused to permit Robertus to answer a question as to whether or not he practiced medicine. Whether or not Robertus did practice medicine was a conclusion of fact for the jury to decide, said the appellate court. The question asked called for an opinion on the part of Robertus, and the answer thereto would not only amount to a mere opinion or conclusion but would be an opinion or conclusion which the witness could not be permitted to testify to because it involved the whole merits of the controversy. The mere fact that a prospective juror may have been treated by a chiropractor does not disqualify him as a juror in the trial of a chiropractor for violating the medical practice act. The conviction was affirmed. —*Robertus v. State (Texas), 45 S. W. (2d) 595.*

**Workmen's Compensation Acts: Refusal to Undergo Operation.**—An employee, in the course of his employment, injured his arm and sought compensation under the workmen's compensation act of Oklahoma. Physicians testified at the hearing that the disability might be removed by a major surgical operation, but the employee refused to submit to the operation. The industrial commission awarded compensation and the employer and his insurance carrier appealed to the Supreme Court of Oklahoma. Whether or not, said the court, an employee may be barred from compensation because he refuses to submit to an operation depends on the nature of the operation. If it is a major operation, involving the slightest risk to life, the employee has the right to refuse to submit to it. He may choose whether he desires to suffer from the disability for the rest of his life or whether he shall take the risk of a surgical operation in order to lessen the disability. In any event, said the court, the employee is entitled to compensation.—*King Drilling Co. v. Massenburg (Okla.), 7 P. (2d) 454.*

# Society Proceedings

## COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Montreal, Sept. 19-23. Dr. William P. Wherry, 1500 Medical Arts Building, Omaha, Neb., Executive Secretary.

American Association of Railway Surgeons, Chicago, November 2-4. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Surgeons, St. Louis, October 17-21. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Physical Therapy Association, Detroit, September 28-30. Dr. C. C. Vinton, 241-02 S. Conduit Blvd., Rosedale, N. Y., Secretary.

American Public Health Association, Washington, D. C., October 24-27. Dr. Kendall Emerson, 450 Seventh Avenue, New York, Acting Executive Secretary.

American Roentgen Ray Society, Detroit, September 27-30. Dr. Eugene P. Pendergrass, 3400 Spruce Street, Philadelphia, Secretary.

Associated Anesthetists of the United States and Canada, New York, October 17-21. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of Military Surgeons of the United States, Hartford, Conn., October 20-22. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Clinical Orthopedic Society, Chicago, November 10-12. Dr. E. B. Mumford, Chamber of Commerce Building, Indianapolis, Secretary.

Delaware, Medical Society of, Lewes, September 27-28. Dr. W. O. La Motte, 604 Medical Arts Building, Wilmington, Secretary.

Indiana State Medical Association, Michigan City, September 27-29. Mr. T. A. Hendricks, 23 East Ohio Street, Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Indianapolis, October 24-28. Dr. W. B. Peck, 12½ East Stephenson Street, Freeport, Ill., Managing Director.

Kentucky State Medical Association, Louisville, October 3-6. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Nevada State Medical Association, Reno, Sept. 23-24. Dr. Horace J. Brown, 120 North Virginia Street, Reno, Secretary.

Northern Minnesota Medical Association, Crookston, Sept. 19-20. Dr. O. O. Larsen, Detroit Lakes, Secretary.

Oregon State Medical Society, Klamath Falls, Sept. 22-24. Dr. Albert W. Holman, 410 Taylor Street, Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, October 3-6. Dr. Walter F. Donaldson, 500 Penn Avenue, Pittsburgh, Secretary.

Vermont State Medical Society, Burlington, October 6-7. Dr. William G. Ricker, 31 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Richmond, November 1-3. Miss Agnes V. Edwards, 1200 East Clay Street, Richmond, Secretary.

## CONFERENCE ON RHEUMATIC DISEASES

*Held Under Sponsorship of the American Committee for the Control of Rheumatism, New Orleans, May 9, 1932*

### Work of the American Committee for the Control of Rheumatism

DR. RALPH PEMBERTON, Philadelphia: Arthritis is the oldest disease on record and is the cause of more pensionable invalidism than any other condition except cardiovascular disease of old age. The medical profession has more or less ignored it, and because of this indifference there has long existed an attitude of pessimism concerning it. About eight years ago in Europe was created the "Ligue Internationale Contre le Rheumatisme." Five years ago the American Committee for the Control of Rheumatism was formed to act in affiliation with the Ligue, to provide for the standardization of treatment of sufferers from arthritis, to stimulate investigation, and to endeavor to extend sound information regarding it to the medical and lay public alike.

The committee recognizes two great types of chronic arthritis, the atrophic or rheumatoid, and hypertrophic or osteo-arthritic. It has published a "Concept," and "Outline" and a "Primer" dealing with the general nature of the rheumatoid problem and setting forth certain basal etiologic, pathologic and therapeutic considerations about which there can be no serious or radical differences of opinion. Scientific exhibits on arthritis were presented at the annual sessions of the American Medical Association in 1930, 1931 and 1932. Clinics have been established in various parts of the country, where treatment has brought help to many sufferers from arthritis.

In order to arrange some formal expression of the views and experiences of others, the committee called this meeting.

### Clinical and Economic Features of Arthritis in 450 Ex-Members of the Military Service

DR. PHILIP B. MATZ, Washington, D. C.: During 1931, about 35,000 ex-service men received over $10,000,000 in disability compensation caused by arthritis, a number constituting 6.4 per cent of all beneficiaries of the Veterans' Administration, and a sum constituting 4.7 per cent of all veterans' benefits. Five degrees of impairment of earning capacity are recognized officially: temporary partial, temporary total, permanent partial, permanent total and double permanent total disability. A group of 450 cases in the hospital for special study included 213 cases of hypertrophic arthritis, 172 of atrophic arthritis, 31 of hypertrophic spondylitis, 14 of "specific" infectious arthritis (gonorrheal, tuberculous), ten of rheumatic fever, and ten miscellaneous. In only 17 per cent of the cases was there evidence of hereditary or familial history of disease of the joints. Exposure and trauma were the chief predisposing factors. A study of dietary habits did not indicate that overindulgence in food is a predisposing factor. No relationship of endocrine disturbance or allergy to the inception of arthritis was found. Focal infection was prominent although not the sole antecedent factor. Patients with hypertrophic spondylitis had an average of five and seven-tenths acute exacerbations, and those with specific arthritis an average of two. For the entire group there was an average of four exacerbations for each patient, and the mean duration of disease of the joints was 130 months. Improvement was noted in 76 per cent of the cases.

DISCUSSION

DR. P. S. HENCH, Rochester, Minn.: Does the question of malingering present a serious problem? It is often difficult to prove the presence of organic disease in patients complaining of diffuse pains in muscles and about joints when no objective articular phenomena, muscle spasms or atrophy, are present. The results of roentgen examination and other laboratory tests do not help much. In the Veterans' Bureau, arthritis is a compensatory disability. If there is a question of money return, especially in times of economic stress, human nature has not changed and the soldier may feel disabled from aches and pains little beyond the "normal."

DR. J. L. DUBROW, Memphis, Tenn.: Electrocardiographic studies similar to those recently reported by Master and Jaffe and the sedimentation test are of diagnostic and prognostic value.

DR. P. B. MATZ, Washington, D. C.: I cannot state how many patients gave a history and subjective symptoms of arthritis and were found on examination not to have any disability. No doubt a number of such patients are drawing compensation, but they cannot escape detection long, as examinations for rating purposes are very carefully done and include roentgenographic and objective evidence.

DR. RALPH PEMBERTON, Philadelphia: Many of Dr. Matz's patients, at the onset of atrophic arthritis, were overweight, a condition somewhat contrary to general experience. Obviously, some were ingesting more food than they could adequately care for, a recognized factor in the rheumatoid syndrome.

### The Relationship of Endocrine Disturbance to Arthritis

DR. FRANCIS C. HALL, Boston: Thyroid deficiency appears to be one of the contributing etiologic factors. Among 150 patients with hypertrophic arthritis, symptoms and signs of hypothyroidism occurred with great frequency. Basal metabolic rates were below —10 in 50 per cent, and below —15 in 34 per cent of 108 patients. The patients were in general well nourished, and no other explanation for hypometabolism was apparent except glandular deficiency. Treatment with thyroid gland was of permanent benefit to 49 per cent of 116 patients to whom it was administered. Among 150 patients with atrophic arthritis, stigmas of hypothyroidism were encountered less frequently and if present might have been accounted for by depletion and undernutrition. Metabolic rates were below —10 in 35.6 per cent and below —15 in 17.7 per cent of 103 patients. Treatment with thyroid gland was of permanent value to only 16.5 per cent of 103 patients; it probably helps by providing better nutrition to joints.

### Relation of the Digestive Tract to Arthritis

DR. T. PRESTON WHITE, Charlotte, N. C.: The rôle of focal infection and its removal is not as important as the discovery and correction of metabolic errors. Ninety-nine cases of atrophic and 112 of hypertrophic arthritis were studied. Only three of thirty patients with atrophic arthritis and only one of thirty-four patients with hypertrophic arthritis received

benefit, and that only temporary, from dental extractions. Only 17 per cent of about fifty patients with atrophic arthritis and 13 per cent of about sixty with hypertrophic arthritis experienced relief from tonsillectomy. Focal removal seems to help only about 10 to 15 per cent of all patients with arthritis and may make 5 per cent of them worse. Of both types observed, 85 per cent of the patients ingested starches excessively, 80 per cent were habitually constipated, and about 40 to 50 per cent were obese. The treatment included Pemberton's (low calory, low carbohydrate) diet, laxatives, increased periods of rest, and physical therapy. Removal of foci, and vaccines played a minor part. About 75 per cent of patients were improved.

DISCUSSION

DR. R. GARFIELD SNYDER, New York: Dietary control is essential, but low colonic irrigations with plain or medicated water are an important therapeutic addition. In spite of criticism of this form of treatment, experience with more than 16,000 irrigations in the treatment of more than 1,000 patients with arthritis seems to show that recovery is hastened and that no injury to the colon results.

DR. A. R. SHANDS, Durham, N. C.: I cannot agree that untoward results do not follow colonic injections. They seem to cause dizziness and extreme weakness in older patients, necessitating their discontinuance. Others are markedly benefited; one patient, bedridden for two or three years, was able to walk after three irrigations. As a rule, those who are going to be improved thereby begin to show some relief after the second or third irrigation. To obtain maximum results from vaccine, colonic irrigations or other treatment, careful attention must be paid to the factor of diet, a matter so far unsettled, as there is no complete understanding of what aberrations in digestive function occur in cases of chronic arthritis.

DR. EARL D. MCBRIDE, Oklahoma City: The laborers in the oil fields of Oklahoma eat heartily and chiefly of meat, beans, potatoes and bread. They are subject to traumatic disorders, chiefly backstrain. An intestinal tract thus overloaded plays an important part in prolonging disability. Trauma and then toxins from food lower the resistance of joints to focal infection, which is ever present and which soon gains headway.

DR. ROBERT B. OSGOOD, Boston: Although several factors, climate, diet, rest and infection, are important in chronic disease, a consideration of the gastro-intestinal tract in chronic arthritis is perhaps most important. Physicians should never fail to study the demands of combustion and elimination. In a large percentage of cases there is evidence in the stools of indigestion caused by starch and of fermentation. An excess of carbohydrate seems to be the chief offender.

DR. PAUL A. MCILHENNY, New Orleans: Ten constipated patients were treated by simple carthartics alone, and ten others with cathartics and high colonic irrigations. Improvement was more decided in the latter group than in the former.

DR. T. PRESTON WHITE, Charlotte, N. C.: In my experience colonic irrigations have been unnecessary when proper diet, laxatives, postural exercises and rest are employed. The expense of long continued irrigations must be considered.

### Coexistent Chronic Infectious (Atrophic) Arthritis and Cholecystitis: Results of Cholecystectomy

DRS. E. STARR JUDD and PHILIP S. HENCH, Rochester, Minn.: Although the gallbladder is not a common focus, it is infected in about 3 to 5 per cent of cases of chronic infectious (atrophic) arthritis. In some cases cholecystitis and infections of joints bear an indirect relationship, both probably arising from some other and primary focus. In other cases, infections of the gallbladder may serve as a focus for arthritis, as it may harbor organisms, generally streptococci, occasionally staphylococci or bacilli, capable of producing experimental lesions in the joints and gallbladders of animals. Bacteriologic and pathologic observations have been made in fifty-five cases of chronic infectious arthritis in which cholecystectomy for coexistent gallbladder disease was performed. In several cases, gallbladder tissue contained arthrotropic organisms. In five of the cases, symptoms related to the joints were completely relieved. In eleven cases there was marked improvement, and in eight definite, although moderate, relief followed operation, a total of 52 per cent. The joints of the remaining twenty-one patients were not appreciably affected by cholecystectomy. These observers concluded that when definite surgical indications for cholecystectomy are present it is justifiable to urge surgical intervention in the biliary tract in the hope that the arthritis may be definitely benefited. Further experience is necessary before one can urge removal of the gallbladder for arthritis when the indications for operation, aside from the arthritis, are not definite. A conservative attitude is probably desirable, yet the nature of chronic infectious arthritis is so malicious that a radical attitude in individual instances may be justified, provided surgery is advocated and accepted without unwarranted promise of benefit.

DISCUSSION

DR. R. GARFIELD SNYDER, New York: Stones or disease of the gallbladder have been found in only 12 of 981 cases of chronic arthritis. Cholecystectomy was performed in two cases, and in addition to relief of the biliary disturbance, both patients reported a rather marked improvement in the symptoms of arthritis, an improvement that has persisted. Hartung and Steinbrocker found infection of the gallbladder in only 4.5 per cent of 200 patients with chronic rheumatism, an incidence no higher than in any other group of general cases in the hospital. Medical treatment has seemed preferable to surgical in my cases: diet, colonic irrigations and nonsurgical drainage of the gallbladder by the Lyon method, the benefits of which seem to be due not so much to drainage of the gallbladder as to drainage of the liver itself, have been employed.

### The Climatic Factor in the Treatment of Rheumatic Disease

DR. W. PAUL HOLBROOK, Tucson, Ariz.: Climate is not a panacea for all rheumatic diseases, and other treatment should not be neglected. The argument in favor of climatic treatment is based on the low incidence of rheumatic disease among local Indians, Mexicans and white persons resident in and near Tucson as compared with the incidence elsewhere, and the results of such treatment in a group of 500 patients with rheumatic fever and chronic arthritis. In cases of recurrent rheumatic fever, referred to Arizona for treatment, all evidence of activity subsided during the patients' stay, and in a large proportion of those with chronic arthritis, even of an advanced state, gratifying results were obtained by general care and climatic treatment alone. The total effect of climate is a composite of humidity, temperature range, barometric pressure, wind velocity, rainfall, concentration of ultraviolet rays, total sun energy, ionization of the air, type and character of exposure to sun, and the like. Studies are being carried on to determine which are the significant factors and how they work.

### The Desensitization Treatment of Chronic Arthritis

DR. JAMES C. SMALL, Philadelphia: The rationale of the desensitization treatment rests on the hypothesis that patients with arthritis have acquired hypersensitive states. The hypersensitive properties of their tissues are acquired from multiple contacts with some foreign substance. In the case of arthritis this substance is provided by the establishment of a focus of infection and of auto-inoculation thereafter. The treatment consists of subcutaneous injections of minute doses of a saline extract of Streptococcus cardioarthritidis. Vaccines from this organism are too toxic for use. The dosages of the saline extract which give beneficial results seem so small as to appear beyond the limits of reason, but as further experience with dosage has been acquired, more and more patients with arthritis have responded favorably. Moderate overdosage leads to prompt and sharp, unfavorable reactions; an apparent paradox appears in that marked overdosage is followed not by prompt but by delayed reaction, appearing only after two or three days and which may, unless recognized and subsequent doses corrected, lead to progressive disability. No stated schedule of antigen dosage can be prearranged, as the injections may activate foci of infection and cause further auto-inoculation. The opsonic index is used to gage the dose. The benefits are not derived from the foreign protein content of the antigen but may depend on the presence of bacterial polysaccharides devoid of sensitizing properties but yet effective in reducing an existing hypersensitization.

### Intravenous Vaccine Therapy in Chronic Arthritis

DRS. MACNIDER WETHERBY and B. J. CLAWSON, Minneapolis: Vaccines from one strain of streptococcus, isolated from a patient with rheumatic fever, are used in the treatment of rheumatic fever, atrophic (rheumatoid) and hypertrophic (osteo) arthritis alike since we believe that no distinct separation of these diseases is warranted. This view is based on the isolation of streptococci from the blood, the common presence of subcutaneous nodules, the similar reactions of streptococcal skin tests, common biologic relationship of the streptococci isolated in all three conditions, and the favorable clinical response of all types to the intravenous streptococcic vaccine therapy, this one strain alone being used. It is of low virulence, it is not a self agglutinator, and it cross agglutinates in high titer with many other strains of streptococci from patients with rheumatic fever and chronic arthritis. The vaccine is given intravenously because Clawson's experimental work on animals showed that streptococci injected subcutaneously may render animals hypersensitive and produce only a moderate degree of protection, while intravenous injection produced desensitization and, more important, a high degree of protection by antibody formation. An initial dose of 100,000,000 bacteria is given and weekly subsequent injections are increased from 100,000,000 up to 800,000,000 organisms. Fever and chills are frequently experienced. Of 300 patients with chronic arthritis so treated, 80 per cent were clinically improved. The degree of improvement bore no relation to the degree of reaction following the injection. Improvement was manifest in most cases after five injections. The agglutinating titer of the patient's blood rises during treatment and improvement is not, as a rule, noted until the titer has risen to 1:6,400, or more. The height of the agglutinating titer in most cases seems to be a reliable indication of the degree of protective immunity to streptococci provided to the patient.

#### DISCUSSION ON PAPERS OF DR. HOLBROOK, DR. SMALL, AND DRS. WETHERBY AND CLAWSON

DR. JOHN W. GRAY, Newark, N. J.: The great army of sufferers from the North cannot be imported to tropical climates and means must be sought of combating the disease where it occurs. With Dr. Gowan, by a modification of Cecil's method, I have isolated streptococci from the blood in 61 per cent of 144 patients with rheumatoid arthritis. Cultures in 133 control cases were essentially sterile. Positive cultures were obtained in from one to three days without opening the containers. Vaccine subcutaneously was abandoned in favor of intravenous injections, the strains isolated being used. An initial dose of 100,000 only was used, and if with increasing amounts discomfort and increased pain in the joints were experienced, the dose was greatly reduced or the vaccine was discontinued temporarily.

DR. WILLIAM J. KERR, San Francisco: Perhaps the common denominator in all these methods of treatment, vaccines, peptone, amidoxylbenzoate, physical therapy of various sorts, sympathectomy and diets, is the improvement of the local circulation to joints. Whether the beneficial results of vaccines are brought about by release of antibodies or by a change in the physical state of the blood is not known. Vaccines can increase the surface temperature of the body. Some foci of infection develop not before but after the appearance of arthritis, probably because of the general condition of the patient. Streptococci are ubiquitous organisms and perhaps the experience that was had with Hodgkin's disease a few years ago is being reported. If enough blood is taken enough times from a patient with a chronic disease and if delicate methods of culture are used best suited for the growth of the organism that is being looked for, perhaps the same thing could be found in many chronic diseases. Most important in treatment is the improvement of the general condition of the patient by all means at hand.

DR. O. O. ASHWORTH, Richmond, Va.: Using a modification of Cecil's method, I have isolated streptococci from the blood of 56 of 138 patients with rheumatoid arthritis. In thirteen cases a gram-positive diplococcus was recovered and by Mellon's culture method these diphtheroids assumed a true streptococcal form. Blood cultures from more than 100 cases of hypertrophic arthritis were negative. Small doses of autogenous vaccines were given intravenously and marked improvement was obtained in 53 per cent of 122 cases of rheumatoid arthritis so treated, improvement generally beginning after a few injections.

DR. RUSSELL L. CECIL, New York: Probably no two of the hundred physicians present have the same ideas about the disease. Get three or four together who are interested in arthritis, and one can start a fight almost any time. As to cutaneous reactions to streptococci, some give a marked reaction, others none at all. When foci of infection are removed early and promptly, nature will often heal the infected joints. Then removal of foci often marks the turning point in the patient's condition. Late in the disease, focal infection plays a minor part; and after three or four years of the disease, it does not make much difference whether or not the foci are removed. There are so many kinds of vaccines, it leaves one in doubt as to where to start. Dr. Small uses small doses, Dr. Wetherby large. The differences in terminology given to the various streptococci used for vaccines should not be a cause for confusion. One may speak of hemolytic streptococci, another of green streptococci, yet be describing the same organism, as the differences in appearance are often due to the culture mediums used. In view of the high agglutinins in patient's serum, the experimental arthritis produced and the high percentage of recovery, I cannot feel that the germs isolated by myself and my colleagues were contaminants.

DR. REGINALD BURBANK, New York: Dr. Small and other advocates of small dosages of bacterial products are attempting desensitization rather than immunization. Small doses tend to decrease formation of antibodies against infective streptococci, whereas massive doses increase such formation and agglutination titer. Both methods can give favorable results. Small dosage is more satisfactory in the long run even though results are slower. Adverse climate is not, per se, conducive to arthritis. Among the Eskimos the disease is almost unknown, as it is in Denmark and Iceland. In other sunnier and warmer climes it is common.

DR. A. ALMON FLETCHER, Toronto: I doubt that Wetherby's method of using large doses of vaccine over short periods of time will have permanent value. A rise in blood agglutinins does not always indicate favorable change. I have seen patients improve while the level of blood agglutinins was falling. Faulty diets, inadequate in vitamins and unbalanced in food factors, predispose to the development of the disease, but it may take years for the influence of suboptimal diets to become apparent. An extended trial of dietetic measures is indicated.

DR. JOHN H. MUSSER, New Orleans: Since I have been in New Orleans I have seen practically no cases of arthritis, in contrast to my experience in Philadelphia, where 50 per cent of patients in wards of hospitals had arthritis.

DR. R. E. UTLEY, Harlingen, Texas: I have never seen acute rheumatism and rarely find a patient with chronic arthritis resident in the extreme southwest of Texas, where there is a low altitude and a dry, semitropical climate.

DR. RALPH PEMBERTON, Philadelphia: Various factors have each an influence and are not at all incompatible one with the other. The successful treatment of arthritis today depends on seeing the problem whole rather than from any single angle of vision, and on advancing a therapeutic program which considers in a coordinated way its various aspects.

DR. JAMES C. SMALL, Philadelphia: I question the value of using the patient's agglutinin titer as an index of his immunity. In order to maintain a high titer there must be available from time to time a certain amount of antigen. Patients with an active focus maintain a high agglutinin titer, which gradually becomes less when foci are eliminated.

DR. MACNIDER WETHERBY, Minneapolis: My experience with intravenous typhoid vaccine has been unsatisfactory in most cases, and raising the agglutinins for typhoid bacilli to a titer of 1:200,000 had no effect on increasing streptococcal agglutinins, whereas the patient with more active involvement tends to have a high agglutination titer, which falls as the activity subsides; this is not comparable to the artificial elevation of agglutinin titer by intravenous vaccine. In such cases there is generally correlation among the agglutinin titer, the clinical improvement and, more significant, the bactericidal power of the blood for streptococci.

# Current Medical Literature

## AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

### American Journal of Physiology, Baltimore

**101:** 213-407 (July) 1932

*Effect of Lumbar Sympathectomy on Flow of Blood in Femoral Artery of Dog. J. F. Herrick, H. E. Essex and E. J. Baldes, Rochester, Minn.—p. 213.
Male Hormone: V. Effect of Male Hormone and Anterior Pituitary. C. Funk, Warsaw, Poland, and B. Harrow, New York.—p. 218.
Factors Which Influence Flow and Protein Content of Subcutaneous Lymph in Dog: I. Hemorrhage and Hyperemia. Florence W. Haynes, Boston.—p. 223.
Further Observations on Rapidity of Passage of Substances from Blood to Lymph in Dog. Florence W. Haynes, Boston.—p. 232.
Accumulation of Lactic Acid in Excised Liver Tissue. J. Haldi, Ann Arbor, Mich.—p. 236.
Prevention of "Castration Cells" in Anterior Pituitary of Male Rat by Administration of Male Sex Hormone. J. D. Reese and M. McQueen-Williams, San Francisco.—p. 239.
Anterior Pituitary Sex Hormone in Blood and Urine of Rats. F. E. Emery, Buffalo.—p. 246.
Metabolism During Growth in Common Pigeon. O. Riddle, Theodora C. Nussmann and F. G. Benedict.—p. 251.
Basal Metabolism of Mourning Dove and Some of Its Hybrids. O. Riddle, Guinevere C. Smith and F. G. Benedict.—p. 260.
Physiologic Action of Dehydrocholic Acid. J. F. Regan and O. H. Horrall, Chicago.—p. 268.
Demonstration of Accelerator Nerve and Postganglionic Parasympathetic Fibers in Vagosympathetic Trunk of Dog. L. O. Morgan and P. P. Goland, Cincinnati.—p. 274.
Studies on Suprarenal Insufficiency: X. Depressor Responses to Small Doses of Adrenalin in Rat, Induced by Loss of Suprarenal Medulla. L. C. Wyman and Caroline tum Suden, Boston.—p. 282.
Elasticity of Dural Sac and Its Contents. L. B. Flexner, Janet H. Clark and L. H. Weed, Baltimore.—p. 292.
Observations on Circulation in Fetal Albino Rat. E. L. Corey, Richmond, Va.—p. 304.
Effect of Castration in Guinea-Pig on Sex-Maturing Potency of Anterior Pituitary. A. E. Severinghaus, New York.—p. 309.
End of Spike Potential of Nerve and Its Relation to Beginning of After-Potential. H. S. Gasser and Helen Tredway Graham, St. Louis.—p. 316.
*Histamine as Hormone for Gastric Secretion. J. Sacks, A. C. Ivy, J. P. Burgess and J. E. Vandolah, Chicago.—p. 331.
Fatigue in Skeletal Muscle in Relation to Frequency of Stimulation. H. Davis and Pauline A. Davis, Boston.—p. 339.
*Studies on Albuminuria Following Exercise: I. Its Incidence in Women and Its Relationship to Negative Phase in Pulse Pressure. Frances A. Hellebrandt, Madison, Wis.—p. 357.
Id.: II. Its Relationship to Speed of Doing Work. Frances A. Hellebrandt, Elizabeth Brogdon and L. E. A. Kelso, Madison, Wis.—p. 365.
Hemodynamics of Arteriosclerosis: Influence of Change of Coefficient of Volume Elasticity on Circulation. G. Fahr, Jay Davis, A. Kerkhof, P. Hallock and E. Giere, Madison, Wis.—p. 376.
Passage of Urea Between Blood and Lumen of Small Intestine. W. R. Pendleton and F. E. West, Los Angeles.—p. 391.
Note on Relationship of Cerebrospinal and Intralabyrinthine Pressures. W. Hughson, Baltimore.—p. 396.

**Effect of Lumbar Sympathectomy on Flow of Blood in Femoral Artery.**—Herrick and his associates made a series of studies on the flow in the femoral artery of the dog. A comparison was made of the minute volume flow in the right and left femoral arteries, both local and general anesthesia being used. After unilateral sympathectomy the flow was again measured. The results show that the flow is the same in the two femoral arteries of the normal dog. Following unilateral sympathectomy, the flow in the femoral artery on the sympathectomized side is about twice as great as that on the intact side. When ether anesthesia is used in place of local infiltration, the difference between the intact and the sympathectomized side is not conspicuous. The authors conclude that surgical ether anesthesia is almost as effective as sympathectomy in producing vasodilatation.

**Histamine as Hormone for Gastric Secretion.**—Sacks and his associates isolated histamine from acid extracts of the pyloric mucosa as a sulphate and picrate. The method is described. Vasodepressor and secretory assays on all fractions from the original acid extract to the final product of histamine crystals and mother liquor yield strong, if not conclusive, evidence that histamine is the sole secretory excitant active subcutaneously in acid extracts of the pyloric mucosa and that histamine was not produced by the chemical procedures employed. Histamine (0.5 to 1 mg.), pilocarpine (5 to 10 mg.) and isopilocarpine (10 mg.) are the only imidazoles out of ten tried that stimulate gastric secretion. Methylene histamine (5 to 10 mg.) does not stimulate gastric secretion. A threshold dose of a gastric secretory excitant is present in 1 or more liters of urine, which is to be expected on the basis of the histamine content of urine. Histaminase destroys the gastric secretory effectiveness of "gastrin" solutions. Histamine adsorbed to Lloyd's reagent maintains its vasodepressor and secretory properties.

**Albuminuria Following Exercise.**—From forty-seven individuals, Hellebrandt made analyses of the urine collected immediately following experimental bouts of physical exertion of various types, such as riding the bicycle ergometer, running around an indoor track at top speed, and working in a rowing machine. It was noted that the incidence of albuminuria increased from 14.8 per cent before exercise to 57.5 per cent after exercise. The pulse pressure fell below normal in all cases after a half hour bicycle ergometer ride. The pulse pressure fall in the cases with postexercise albuminuria was 90.1 per cent greater in depth and was maintained 41.8 per cent longer than the pulse pressure fall in the cases without albumin following physical exertion. The greatest amount of albumin was found to occur during the period of oliguria and the maximal reduction in the amplitude of the pulse pressure. The author explains the experimental results by the hypothesis that strenuous exercise shunts the blood to the working muscles and the skin, affecting the circulation of the kidney in such a way as to cause asphyxiation of the renal cells beyond that compatible with normal function. The deep and protracted postexercise low pulse pressure adds to the anoxemia already present and induces an abnormal accumulation of acids in the renal tissue which alters its permeability to the blood proteins and albumin appears in the urine.

### Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

**27:** 801-943 (June) 1932

Abnormalities of Vertebral Body. W. A. Evans, Detroit.—p. 801.
Intrinsic Circulation of Vertebral Body, with Roentgenologic Considerations. G. Wagoner and E. P. Pendergrass, Philadelphia.—p. 818.
*Roentgen Signs of Tuberculosis of Vertebral Body. H. P. Doub and C. E. Badgley, Detroit.—p. 827.
*Colon as Studied by Double Contrast Enema. J. Gershon-Cohen and H. Shay, Philadelphia.—p. 838.
Viscosity of Lipiodol in Bronchography. R. G. Bloch, Chicago.—p. 847.
Roentgenographic Study of Glass and Its Visibility as Foreign Body. R. W. Lewis, New York.—p. 853.
Primary Carcinoma of Lung: Roentgen Diagnosis and Preliminary Report of Roentgen Therapy. W. F. Manges, Philadelphia.—p. 858.
Therapeutic Application of Roentgen Ray in Angina Pectoris. E. C. Samuel and E. R. Bowie, New Orleans.—p. 870.
*Evaluation of High Voltage Roentgen Rays in Therapy of Carcinoma of Cervix. C. A. Behney, Philadelphia.—p. 877.
International Comparison of Roentgen-Ray Units. L. S. Taylor, Washington, D. C.—p. 884.
Studies of Effect of Roentgen Rays on Time of First Cleavage in Some Marine Invertebrate Eggs: I. Recovery from Roentgen-Ray Effects in Arbacia Eggs. P. S. Henshaw, New York.—p. 890.
Lipiodol Injection of Uterine Cavity in Hydatidiform Mole: Case Report. R. L. Lochry, Indianapolis.—p. 899.

**Tuberculosis of Vertebral Body.**—Doub and Badgley call attention to the fact that the roentgenologist must know the pathologic changes in tuberculosis of the spine and must be able to correlate these with the corresponding roentgen signs. A series of 100 cases are included in their study. The age incidence in the series was studied; the average was found to be 29 years. The average duration of symptoms at the first examination was six and one-half years. The mode of infection is discussed and the hematogenous route is favored, but the lymphogenous route may also play a part. A suggestion is made that in some cases the primary infection may be in the disk. Roentgenologically, the authors distinguish the following types of tuberculous involvement of the body of the vertebra: (1) central type; (2) intervertebral articular type, and (3) anterior type. They tabulate the frequency of the various types of infection according to the location in the spine and find

that the central type of lesion is more common in the thoracic area and that the intervertebral type is more common in the lumbar area. The central type causes collapse of the body of the vertebra in a high percentage of cases, while in the intervertebral type the vertebral body form is preserved until late in the disease. Narrowing of the disk is the earliest and most constant roentgen sign in tuberculosis of the spine. Abscess is the most common complication and was found in 84 per cent of the authors' cases at some stage of the disease. Skipped infection, or two areas of infection with normal vertebrae between, was found in 10 per cent of the cases. Concomitant tuberculosis in other parts of the body was found in fifty-three instances. The pulmonary lesion was the most common concomitant lesion and was present in twenty-four cases.

**Colon as Studied by Double Contrast Enema.**—Gershon-Cohen and Shay state that the double contrast enema aids in the roentgen diagnosis of spasms and adhesions of the colon; it makes possible elimination of errors in diagnosis due to filling defects, the result of incomplete filling and spasm. It allows a more conclusive differentiation from the roentgen observations alone between irritable colon and so-called spastic colitis and true inflammatory and ulcerative colitis. It is a distinct advance in the roentgen diagnosis of ileocecal tuberculosis, simplifying greatly the procedure of study recommended thus far by the best investigators in this field who have been using the opaque medium by mouth. Additional roentgen signs are made available in the diagnosis of chronic ulcerative colitis. Additional information is furnished by the double contrast roentgenograms in determining the actual number and extent of diverticula of the colon and the presence or absence of concomitant inflammatory changes in any of them. Early neoplastic growths, long before they produce filling defects in the single contrast enema films, are detectable in the double contrast roentgenograms and open the way for the surgeon to go a step further, by their early removal, in the prevention of malignant degeneration. The authors recommend the double contrast enema study as an additional routine examination to the ordinary enema study of the colon because it always furnishes a check duplicate study of the colon; it lends confirmatory aid and makes possible the detection of valuable supplementary observations in cases ordinarily studied with difficulty by the single contrast enema, and, lastly, it makes possible the detection of lesions not suspected or demonstrable by the single contrast method alone.

**Evaluation of High Voltage Roentgen Rays in Therapy of Carcinoma of Cervix.**—Behney points out that high voltage roentgen therapy is a distinct addition to the present therapeutic armamentarium for the treatment of carcinoma of the cervix. Used in addition to local radon applications in stage 3 and earlier cases, it will increase the expectancy of life. Local irradiation of the growth should be practiced in all cases earlier than stage 4. The therapy of patients whose lesions have advanced to stage 4 should be confined to external short wavelength radiations in the form of high voltage roentgen rays or packs. In late cases this treatment prolongs life, reduces pain, and restores hope. Recurrent cases must be individualized and the plan of treatment should depend on the degree of extension of the growth and the general condition of each particular patient.

## American Review of Tuberculosis, New York

**26:** 1-103 (July) 1932

*Nodules of Experimental Tuberculosis in Guinea-Pig and Their Relations to Immunity. H. Sewall, E. de Savitsch and C. Butler, Denver.—p. 1.
Experimental Tuberculosis in Albino Rat: Comparative Effects of Avitaminosis, Suprarenalectomy and Thyroid-Parathyroidectomy on Experimental Tuberculosis. M. M. Steinbach, New York.—p. 52.
*Fluttering of Abdominal Viscera as Complication Following Left-Sided Phrenico-Exeresis. G. E. Ehrenburg, Spivak, Colo.—p. 77.
Modern Case-Finding in Tuberculosis. D. S. Brachman, Detroit.—p. 89.
Tuberculosis Among Medical Students. J. Steidl, Boston.—p. 98.

**Nodules of Experimental Tuberculosis.**—Sewall and his associates give an account of the development of the primary nodule of tuberculosis in the guinea-pig, with its vascular supply and associated tissue changes. They noted that the incubation period of the primary nodule varies somewhat inversely with the infecting dose and seems shortened by tissue irritation. Apparently, forces of stimulation and inhibition are coordinated in the development of the nodule. Infections with 0.01 mg. of a pure culture of tubercle bacilli may cause slight subcutaneous tissue condensations in advance of nodule formation. Such deposits greatly increased up to the authors' maximum dose of 10 mg. They are of inflammatory origin and are probably due to nonspecific chemical irritation resulting in fixation of the water of edema. With large bacillary doses, from 1 to 10 mg., the acceleration and physical characters of the effects of infection closely resemble those commonly described as peculiar to reinfection. When a guinea-pig is infected in one groin and then on successive days is reinfected in the other, a nodule is formed after the secondary dose similar in physical character and history to the primary nodule. But the incubation period of the second nodule is apparently progressively slightly shortened from the first day, as compared with that of primary infection in the experimental and control animals. When the interval between infection and reinfection reaches about seven days, the latent period of the nodule of reinfection is suddenly greatly decreased; this is about the time required for development of the primary nodule of infection on the opposite side. Thereafter the response to reinfection maintains its acceleration, whatever the interval.

**Fluttering of Abdominal Viscera.**—Ehrenburg reports that roentgen examination in cases in which left-sided phrenic avulsion was performed revealed displacement of the stomach and duodenum to the left and upward. This displacement is considerably greater in inspiration than in expiration. The shape of the duodenum (normally, at roentgen examination, the bulb and pars descendens form a sharp angle) undergoes a considerable change and presents an arch approaching a straight line. By comparing the inspiratory and expiratory roentgenograms, one can recognize a swinging of the pylorus and duodenum from right to left and back again, the excursion being about two inches. The stomach shows a large bubble of air, which is belched up easily and is replaced in a few seconds. High tonus of the stomach and duodenum is present. The stomach empties rapidly, usually in two hours. The swinging of the duodenum causes a constant irritation of this viscus, which is apparently chiefly responsible for the various manifestations of indigestion. These digestive disturbances do not interfere with recovery, though in some cases they are annoying. Light meals at frequent intervals alleviate the symptoms. The author regards "fluttering of the abdominal viscera" as the proper name for this complication.

## Annals of Internal Medicine, Ann Arbor, Mich.

**5:** 1447-1594 (June) 1932

*Experimental Basis for Intravenous Vaccine Therapy in Chronic Arthritis, with Summary of Results Obtained in Patients. B. J. Clawson and M. Wetherby, Minneapolis.—p. 1447.
*Hypertension and Diabetes. H. J. John, Cleveland.—p. 1462.
*Fallacy of Weighed Diet in Treatment of Diabetes Mellitus. H. Ulrich, Boston.—p. 1487.
Myxedema: Case Report. H. B. Gotten, Memphis, Tenn.—p. 1492.
*Hypothyroidism Without Myxedema. J. B. Youmans and S. S. Riven, Nashville, Tenn.—p. 1497.
Ventricular Paroxysmal Tachycardia: Report of Case. E. W. Hollingsworth, Hines, Ill.—p. 1506.
Control of Tick-Borne Diseases: Methods and Economics. N. Toomey, Palmyra, Mo.—p. 1513.
Etiology of Colds. J. E. Walker, Opelika, Ala.—p. 1526.
A Layman Considers Migraine. W. B. Sheppard, Denver.—p. 1532.
Presidential Address: American College of Physicians. S. M. White, Minneapolis.—p. 1540.

**Vaccine Therapy in Chronic Arthritis.**—In 301 cases of chronic arthritis, Clawson and Wetherby gave five or more intravenous injections of a streptococcus vaccine at weekly intervals. The organism used in the vaccine was from a case of acute rheumatic fever and had been growing in culture for nine years, was of low virulence, did not agglutinate spontaneously, and was safe for intravenous injections. Cross agglutination occurred in high dilutions (1 : 50,000) with many other strains of both acute rheumatic and chronic arthritis origins. The initial dose was 100 million organisms. This was increased by 100 million organisms at weekly injections. As a rule, not more than eight or ten injections were given. Slight reactions with temperature and chills occurred in about 50 per cent of the cases. The degree of reaction seemed to have no relation to the clinical improvement. Nearly two thirds of the patients experiencing improvement did so after five injections; nine

tenths did so after seven injections. There were only a few cases in which improvement took place if it had not occurred with eight or ten injections. Definite clinical improvement was observed in 80 per cent of the cases.

**Hypertension and Diabetes.**—John states that the blood pressure in nondiabetic persons rises proportionately higher in the case of obese individuals than in those of normal weight (approximately 12 per cent increase). Reduction in weight in nondiabetic persons brings about reduction in blood pressure. In the author's series of 1,828 cases of diabetes, the blood pressure was the same as in normal persons below and including the fourth decade; above this age the incidence of high blood pressure was greater in diabetic persons. In his series of 443 cases of diabetes associated with hyperthyroidism, 37.6 per cent of the patients had a blood pressure below 140 mm. and 62.4 per cent had a blood pressure above 140 mm., against 54.3 and 45.7 per cent, respectively, in diabetes not associated with hyperthyroidism. In his series of cases the diabetic persons up to 30 years of age showed hypertension only in 9 per cent, whereas in diabetic persons with hyperthyroidism, hypertension was present in 42 per cent of this group of young individuals. Up to the fifth decade, hypertension in itself presents no marked incidence of diabetes; after the fifth decade the incidence rises markedly.

**Fallacy of Weighed Diet in Treatment of Diabetes Mellitus.**—When Ulrich began to treat diabetes he followed the prevalent custom of prescribing weighed diets, but he soon abandoned that method. During the past ten years he has not asked one of his patients to follow it. He is using more easily understood household measures and natural food units in his dietetic prescriptions and presents a table showing a day's ration by which approximate accuracy is reached without the use of the scales. The percentages of carbohydrate, protein and fat in this table are rough approximations only, but he is confident that they are nearly as accurate as if the food had been weighed with the utmost care. This statement is supported by the results obtained with a group of patients who received an unweighed diet and whose level of the blood sugar was determined on several consecutive mornings before breakfast. A comparison of these results with others obtained with patients receiving a weighed diet showed no significant differences in regard to the daily variations of the blood sugar. The author is aware that dietetic prescriptions by weights and calories are easier for the physician. He uses them constantly in the hospital where the services of a trained dietitian are available. Outside the hospital, however, the burden of translating such a prescription into a day's menu is placed on the patient. A few patients have sufficient leisure, inclination and intelligence to do it in a satisfactory manner; many more have not. They should not be required to perform a task that properly belongs to the physician.

**Hypothyroidism Without Myxedema.**—Youmans and Riven believe that hypothyroidism without myxedema is a more common condition than is generally appreciated and is not confined to regions where goiter is frequent. Failure to recognize the disease is due to the vague symptomatology and to the fact that the signs and symptoms of myxedema, the better known hypothyroid state, are lacking. The diagnosis depends largely on the detection of an abnormally low basal metabolic rate; but this observation must be interpreted with caution, since low rates are not all due to hypothyroidism. In diagnosis, the nature of the response to thyroid substance, which is specific in true hypothyroidism, is of great importance and serves to distinguish between lowered metabolic rates due to hypothyroidism and those due to other causes.

## Annals of Medical History, New York

**4:** 321-414 (July) 1932

Thomas Dimsdale, M.D., F.R.S. and Inoculation of Catherine the Great of Russia. W. J. Bishop, London, England.—p. 321.
David Gruby. T. Rosenthal, New York.—p. 339.
Life and Times of Dr. William Harvey. W. Herringham, Hampstead, England.—p. 347.
Struensee. W. F. Petersen, Chicago.—p. 364.
Hernia Healers. J. E. Raaf, Rochester, N. Y.—p. 377.
"Original Morton Inhaler" for Ether. G. B. Roth, Washington, D. C.—p. 390.
Notes on Medical History of Bruges and Hospital of Saint John. H. M. Tovell, Toronto, Canada.—p. 398.

## Annals of Surgery, Philadelphia

**96:** 1-160 (July) 1932

*Treatment of Fractures of Neck of Femur. A. B. Gill, Philadelphia.—p. 1.
Knee Joint Arthrotomy. J. J. Moorhead, New York.—p. 17.
Operation for Recurrent Inferior Radio-Ulnar Dislocation. E. L. Eliason, Philadelphia.—p. 27.
Study of Cause of Death Following Burns. W. G. Harrison, Jr., and A. Blalock, Nashville, Tenn.—p. 36.
Embolectomy: Report of Case Involving Femoral Artery. E. Andrews and H. Harkins, Chicago.—p. 40.
Embolectomy with Partial Arterial Occlusion for Embolism of Extremities. H. Neuhof, New York.—p. 44.
Insulin and Surgery. P. D. Abramson, Shreveport, La.—p. 49.
Mortality Resulting from Surgical Treatment of Chronic Gallbladder Disease in Diabetes Mellitus. I. M. Rabinowitch, Montreal, Canada.—p. 70.
*Fat Embolism. R. B. Wright, Baltimore.—p. 75.
One Thousand Spinal Anesthesias, with Especial Reference to Complications and Mortality. H. W. Jones, San Antonio, Texas.—p. 85.
Acute Intussusception in Infancy and Childhood: Review of Sixty-Four Cases. E. W. Peterson and R. F. Carter, New York.—p. 94.
Pericolic Membranes. W. L. Duffield, Brooklyn.—p. 98.
Kerr Technic in Resections of Colon. J. H. Gibbon, Philadelphia.—p. 102.

**Fractures of Neck of Femur.**—Gill states that, in fractures of the neck of the femur, some patients on admission to the hospital are not fit subjects for any treatment directed toward the reduction and fixation of the fracture. There is a high mortality, probably 25 per cent, when all cases of fracture are included in the statistical tables. The mortality rate increases rapidly beyond the age of 60. Nonoperative methods of treatment of recent fractures will continue to be used in the majority of cases. Of these the Whitman abduction method has given the best results. Open operation should be the method of choice in selected cases. The most common causes of nonunion are failure in making a diagnosis of fracture, and improper treatment in cases that have been correctly diagnosed. But nonunion may be expected in 20 to 25 per cent of the cases treated by the Whitman method or by open operation. The rate is low in patients under 60 years and increases rapidly beyond this age. In ununited fracture, if the head is viable and if a fair portion of the neck has survived, union may be hoped for in 75 to 90 per cent by means of an autogenous bone graft or a Smith-Petersen nail. Satisfactory union should not be expected in the presence of necrosis of the head, and rapid and complete absorption of the neck. For this group of cases a reconstruction operation offers a 75 per cent chance of securing good function in patients under 60 years of age. In patients beyond this age, its advantages are doubtful. Arthrodesis of the hip affords relief to some patients after any or all of the operations mentioned have failed. If it becomes possible to select early in their history those cases that are doomed to failure of union by any method of treatment, an early arthrodesis will avoid months and years of useless treatment and disability.

**Fat Embolism.**—Wright presents the clinical and pathologic aspects of fat embolism. He reports two cases of this condition, one resulting in death and the other in recovery. A digest of 100 consecutive necropsies as regards this condition is presented. The author believes that fat embolism should be considered in any case in which there are grave or unusual symptoms following trauma, whether the trauma is fracture, contusion, concussion, intravenous therapy, delivery or operation.

## Colorado Medicine, Denver

**29:** 269-308 (July) 1932

Postpneumonic Nonresolution and Syphilis. R. H. Kampmeier, Pueblo.—p. 273.
Indications for Treatment of Obesity. A. Minnig, Denver.—p. 277.
"Cowl Fractures." J. D. Carey, Fort Collins.—p. 280.
Evaporated Milk in Infant Feeding. H. B. Stein, Denver.—p. 281.

## Johns Hopkins Hospital Bulletin, Baltimore

**51:** 1-60 (July) 1932

*Metabolic Changes Following Intravenous Injection of Posterior Pituitary Extracts and Their Correlation with Well Known Pharmacodynamic Actions of Drugs. E. M. K. Geiling and A. M. DeLawder, Baltimore.—p. 1.
Diabetes Mellitus and Myxedema. A. Weinstein, Baltimore.—p. 27.
Tuberculous Infection in Medical Students. N. B. Herman, F. H. Baetjer and J. A. Doull, Baltimore.—p. 41.

**Intravenous Injection of Pituitary Extracts.**—Geiling and DeLawder present experimental data from which the following conclusions seem warranted: After the injection of

solution of pituitary and pitressin there follows for a short period (the stage of maximum action) a state resembling anaerobic metabolism in the tissues drained by the superficial and deep leg veins of dogs. During this time the venous blood is characterized by an arterial-like color and oxygen content, a lowered carbon dioxide tension, a rapidly rising lactic acid concentration, increased dextrose and inorganic phosphate. This is the period of decreased cardiac output and lowered basal metabolism. Following this stage of tissue asphyxia is the recovery period, when conditions are reversed: an abnormally dark venous blood, increased utilization of oxygen and production of carbon dioxide by the tissues, and a continued rise and subsequent gradual return of blood lactic acid to the preinjection level. Blood drawn from the external jugular vein (having a mixed drainage area, brain, muscle, and so on) in the period of the so-called maximum action of solution of pituitary and pitressin indicates a different effect of these drugs in this region. In contrast to the arterial-like leg sample, the jugular blood is more venous in color and has a decreased oxygen content, only a slight, if any alteration in the carbon dioxide concentration, and a lactic acid increase similar to that in the femoral blood. The return of the basal level roughly parallels the recovery period indicated in the blood draining the limbs.

## Journal of Bone and Joint Surgery, Boston

**14:** 471-740 (July) 1932


*Correlation of Experimental Streptococcic Arthritis in Rabbits with Chronic Rheumatoid Arthritis. L. G. Hadjopoulos and R. Burbank, New York.—p. 471.

Pathologic Fractures in Osteomyelitis. N. Capener, Exeter, England, and K. C. Pierce, Ann Arbor, Mich.—p. 501.

Spondylolisthesis and Vertebral Anomalies in Skeletons of American Aborigines, with Clinical Notes on Spondylolisthesis. R. T. Congdon, Wenatchee, Wash.—p. 511.

*Operative Fusion of Unstable or Flail Knee Due to Anterior Poliomyelitis. M. Cleveland, New York.—p. 525.

*Osteochondritis Dissecans: Clinical Study of Twenty-Four Cases. D. King, Ann Arbor, Mich.—p. 535.

Kyphosis Adolescentium. B. Frejka, Brno, Czechoslovakia.—p. 545.

Excision of Hemivertebrae for Correction of Congenital Scoliosis. E. L. Compere, Chicago.—p. 555.

*Ostearthritis Deformans Contrasted with Ostearthritis Deformans Juvenilis. F. J. Lang, Innsbruck, Austria.—p. 563.

Operative Treatment of Chronic Dislocation of Peroneal Tendons. E. Jones, Los Angeles.—p. 574.

Echinococcus Disease of Bone. B. L. Coley, New York.—p. 577.

Treatment of Fractures of Shafts of Tibia and Fibula. R. W. Jones, Liverpool, England.—p. 591.

Treatment of Osteomyelitis in Warm Salt-Water Pool. A. Brockway, Los Angeles.—p. 611.

Flexion Contracture of Knee. J. Kulowski, Iowa City.—p. 618.

Intermittent Hydrarthrosis. J. L. Porter and R. C. Lonergan, Evanston, Ill.—p. 631.

Fracture of Patella. F. R. Ober, Boston.—p. 640.

"Osteoplastic Cuneiform Osteotomy" in Treatment of Ankylosis. S. Orell, Styrsö, Sweden.—p. 643.

Operation for Reconstruction of Inadequate Acetabulum. J. D. Bisgard, Chicago.—p. 655.

Treatment of Joint Lesions in Hemophilia by Means of Whole Blood from Menstruating Women. M. A. Bernstein, Chicago.—p. 659.

Intrapelvic Protrusion of Acetabulum (Otto Pelvis). M. M. Pomeranz, New York.—p. 663.

Arthrokatadysis of Hip Joint. N. A. Cary and L. Barnard, Oakland, Calif.—p. 687.

Tuberculosis of Fifth Lumbar Vertebra with Spina Bifida Occulta: Spinal Fusion and Cure. M. O. Henry, Minneapolis.—p. 690.

Reducing Diet in Orthopedic Surgery. E. S. Geist, Minneapolis.—p. 693.

Unusual Injury to Forearm: Report of Case. Penelope Sherwood, Newburgh, N. Y.—p. 696.

Section of Flexor Tendons of Middle Finger of Left Hand Through Palmar Wound: Primary Suture and Cure. A. Andreasen, Kingston Hill, England.—p. 700.

Hemangiectatic Hemihypertrophy with Subjective Symptoms of Sacro-Iliac Disturbance Due to Abnormal Bony Development: Case. J. E. M. Thomson, Lincoln, Neb.—p. 702.

Osteogenic Sarcoma in Child of Three Years. A. L. Craig, Honolulu, Hawaii.—p. 707.

Analysis of Private Orthopedic Practice. R. Stephens, New York.—p. 712.

Orthopedic Lever for Correcting Deformities of Foot. F. F. Kortlucke, Edinburgh, Scotland.—p. 715.

New Hip Rest for Application of Plaster-of-Paris Spicas or Jackets in Prone or Supine Positions. N. H. Rachlin, Brooklyn.—p. 718.

The Roller Skate as Aid to Active Motion and Muscle Training in Cases of Poliomyelitis. N. H. Rachlin, Brooklyn.—p. 723.


**Experimental Streptococcic Arthritis.**—By injecting certain mannite-fermenting arthrotropic streptococci, isolated from the blood stream of afebrile arthritic patients, Hadjopoulos and Burbank were able to produce in rabbits pathologic lesions exactly comparable to those found in chronic arthritis in the human being. By incubating the whole joint they were able to demonstrate these infecting organisms in practically all lesions associated with chronic atrophic arthropathies. Streptococci were found in every part of the synovial tissues where pathologic changes could be detected. No streptococci could be demonstrated in compact bone, yet the spread of infection in bone tissue could be traced step by step through its medullary and haversian vascular supply. In the avascular cartilage, the spread of streptococci was through infected bone tissue and synovial infiltration. Normal joints were subjected to the same procedure with uniformly negative results. To complete the picture of infection, the authors have recently studied the tendons and muscles in the immediate neighborhood of arthritic joints. They had no difficulty in demonstrating streptococci in tendons at the zone of nuclear proliferation. Muscles were extensively infiltrated with streptococci at their sheaths, but in spite of great care the possibility of outside contamination in surface areas must be considered. Throughout this study the progress of the disease could always be traced directly to the terminal blood vessels, as is true in all infections of hematogenous origin. Despite the specific selectivity of the arthrotropic streptococci used in these experiments, internal organs, especially the liver and kidneys, were not exempt from pathologic changes of toxic nature involving their parenchyma. Nevertheless, streptococci could be demonstrated in the interlobular connective tissue of the liver, and occasionally even in the hepatic vessels. This observation is highly significant in that it forcibly brings home the fact that chronic rheumatoid arthritis is fundamentally a systemic disease, and it explains the transient septicemias that occur intermittently in the course of the infection.

**Operative Fusion of Flail Knee Due to Anterior Poliomyelitis.**—Cleveland presents an analysis of the end-results of ninety operations for fusion of an unstable knee due to anterior poliomyelitis. The operation was without risk and resulted in no appreciable shortening of the leg. All but a small number of the patients were pleased with the end-results. They were able to discard their braces and walk better. Eighty-five per cent of them had good or excellent cosmetic and functional results. In the younger patients, aged 13 years and less at the time of operation, postoperative deformity-flexion and knock-knee are apt to occur. This is apparently due to gravity and unopposed action of the hamstring muscles on ununited epiphyses. Failure of fusion occurred in but two cases and was easily corrected by operative revision. The best results are obtained in patients with paralysis limited to one leg, but the patients with both extremities involved are greatly benefited.

**Osteochondritis Dissecans.**—King points out that osteochondritis dissecans occurs primarily in males in the second decade of life and is characterized by death of a special portion of the epiphyseal nucleus and articular cartilage of the knee and elbow joints. Other joints may be affected. The condition was bilateral in 20 per cent of the author's cases. There is a great tendency to loose-body formation. A clinical history of recurrent locking in a young man, without a history of trauma severe enough to cause a fractured cartilage, suggests osteochondritis dissecans. The diagnosis is rarely made on history and clinical examination alone; roentgen examination is diagnostic. The presence of loose bodies in a knee or elbow joint, whose source is not obvious, suggests a previous osteochondritis dissecans. Radical operation gives a good result in 88 per cent of cases. Slumbering osteochondritis dissecans should be treated conservatively without operation, as spontaneous healing has been demonstrated in these cases. Long-standing cases with many free bodies and severe arthritis may not be cured by operation, because many of the subjective symptoms are due to the accompanying arthritis.

**Ostearthritis Deformans and Ostearthritis Deformans Juvenilis.**—Lang states that there are no fundamental differences between arthritis deformans of the adult and juvenile arthritis deformans. Both types of the disease originate after damage to the articular and joint cartilage with subsequent loss of its elasticity. This loss of elasticity removes the protection that the normal cartilage affords to the subchondral bone against functional and mechanical influences. As a causa-

tive agent for arthritis deformans in adults, the damage to the cartilage, resulting from excessive strains, is of primary importance. In juvenile arthritis deformans, direct and indirect traumatic damages to the cartilage and, especially, to the osteochondral junction are held responsible. The decisive factor for the progressive course of both types of arthritis deformans is the action of the functional requirements which, acting as a source of constant irritation, forms the basis for the progressive character of the disease.

## Journal of Clinical Investigation, New York

**11:** 647-870 (July) 1932

Effect of Injection of Nonspecific Protein on Pain of Ulcer and on Gastric Secretion: Clinical and Experimental Study. F. R. Vanzant and A. M. Snell, Rochester, Minn.—p. 647.
Metabolism of Leukocytes from Normal and Leukemic Blood. L. J. Soffer and M. M. Wintrobe, Baltimore.—p. 661.
Lipid Content of Tumors. M. Yasuda and W. R. Bloor, Rochester, N. Y.—p. 677.
Plasmapheresis Edema: I. Relation of Reduction of Serum Proteins to Edema and Pathologic Anatomy Accompanying Plasmapheresis. D. C. Darrow, E. B. Hopper and M. Katharine Cary, New Haven, Conn. —p. 683.
Id.: II. Effect of Reduction of Serum Protein on Electrolyte Pattern and Calcium Concentration. D. C. Darrow, E. B. Hopper and M. Katharine Cary, New Haven, Conn.—p. 701.
*Passage of Fluid and Protein Through Human Capillary Wall During Venous Congestion. E. M. Landis, L. Jonas, M. Angevine and W. Erb, Philadelphia.—p. 717.
Study of Protein-Lipid Combinations in Blood and Body Fluids: I. Normal Human and Dog Plasma and Horse Serum. Mary E. Turner and R. B. Gibson, Iowa City.—p. 735.
*Blood Uric Acid in Disease. E. P. Jordan and Dorothy Gaston, Chicago. —p. 747.
Study of Gastric Secretion in Hyperthyroidism Before and After Operation. W. R. Berryhill and H. A. Williams, Cleveland.—p. 753.
Thyroid Hyperplasia Produced in Chickens by Ultraviolet Light Deficiency. K. B. Turner and Ethel M. Benedict, New York.—p. 761.
Lactic Acid in Blood of Resting Man. A. V. Bock, D. B. Dill and H. T. Edwards, Boston.—p. 775.
*Study of Circulation in Obesity. S. H. Prodger and H. Dennig, Heidelberg, Germany.—p. 789.

**Human Capillary Wall During Venous Congestion.**—Blood samples removed from the arm veins during graded congestion were compared by Landis and his associates in order to measure the filtration of fluid resulting from the increased venous pressure. The loss of protein through the capillary wall was estimated at venous pressures of 80, 60 and 40 mm. of mercury. Comparison of hemoglobin readings and red cell counts showed that during venous congestion the fluid is lost chiefly from the plasma. The loss of fluid could be detected at venous pressures as low as 20 mm. of mercury and amounted to between 0.0 and 2.3 cc. per hundred cubic centimeters of blood. The amount of fluid lost from the blood was conspicuously greater at higher venous pressures; venous congestion of 80 mm. of mercury filtered as much as 19.5 cc. per hundred cubic centimeters of blood. At a venous pressure of 80 mm. of mercury, protein was lost from the blood plasma in an amount indicating that the capillary filtrate contained an average of 1.5 per cent of protein. At a venous pressure of 60 mm. of mercury, very little protein loss could be detected and the capillary filtrate contained an average of 0.3 per cent of protein. The authors describe two cases of edema in which edema fluid was collected during venous congestion. The protein content of the edema fluid was 0.39 and 0.09 per cent, indicating that the capillary wall retained approximately 95 per cent of the plasma protein.

**Blood Uric Acid in Disease.**—Jordan and Gaston state that, with the discovery of the uric acid diathesis in gout, attention was focused on purine metabolism. Further studies have indicated that the relationship between uric acid retention and gout is not as simple as at first believed. Observers have reported considerable variation in the amount of blood uric acid under normal conditions as well as in diseases other than gout. The significance of these observations is not as yet thoroughly undersood. Although mention of gout in the contemporary American literature is unusual, it has been the authors' experience to find the condition among Chicago patients with greater frequency than was anticipated. Whether a similar incidence of gout occurs in other parts of the country would be a matter of interest. The amount of uric acid in the blood under normal and pathologic conditions is a matter of basic importance. The more accurately the determinations can be made, the sooner will the understanding of purine metabolism approach scientific precision. By Folin's method most, if not all, patients with gout will show blood uric acid values above a range which the authors accept as normal. The difficulty in diagnosis lies in distinguishing the higher values obtained in conditions other than gout. Most of such high values have occurred in the various conditions already known to be at times associated with high blood uric acid.

**Circulation in Obesity.**—Prodger and Dennig studied various phases of the circulation in a group of obese patients who had no demonstrable pathologic changes in the circulatory system, chiefly in their response to mild exercise in the form of walking on a treadmill. The results were compared with the results in a group of normal persons. The responses of the cardiac output and arteriovenous oxygen differences to exercise were similar in the two groups. The chief differences between the two groups were found in the vital capacities, and in the pulse rates, respiratory rates, blood lactic acid changes, oxygen consumptions, and oxygen debts in exercise. On the basis of their observations the authors believe that the symptoms which are so commonly associated with cardiac insufficiency and which are frequently observed in cases of simple obesity are not due to an inefficient circulatory response but rather to mechanical and chemical disturbances associated with obesity.

## Michigan State M. Society Journal, Grand Rapids

**31:** 437-508 (July) 1932

Acute Epidemic Encephalitis. F. P. Currier and D. B. Davis, Grand Rapids.—p. 437.
*Routine Use of Filament-Nonfilament Count. W. S. Reveno and M. S. Berent, Detroit.—p. 443.
*Report of Series of Cases of Bougie and Bag Inductions of Labor. G. A. Carmichael, Ann Arbor.—p. 449.
Actinomycosis Primary in Ovary: Case Report. C. E. Boys, Kalamazoo. —p. 453.
Spinal Anesthesia in Cases of Emergency Surgery. E. G. Krieg, Detroit. —p. 456.
Rural Obstetrics: Analysis of Five Hundred Cases. C. F. Dubois, Alma.—p. 462.
Kidney Infections of Adolescent Female. R. L. Cowen, Detroit.—p. 469.
Asphyxia Neonatorum. H. Henderson, Detroit.—p. 471.
Relationship of Laryngeal Paralysis to Medicine and Surgery. E. E. Poos, Detroit.—p. 477.
Report of Three Cases of Trichiniasis with One Death. C. N. Sowers, Benton Harbor.—p. 479.
Primary Carcinoma of Liver in Infant: Case. M. Pierson and Mary Campbell, Detroit.—p. 482.
Michigan's Department of Health. C. C. Slemons, Lansing.—p. 483.

**Filament-Nonfilament Count.**—In a study conducted on 100 patients, Reveno and Berent found that the determination of the percentages of the nonfilamentous and filamentous neutrophils, lymphocytes, monocytes, eosinophils and basophils, by counting 100 consecutive leukocytes, lends itself readily for routine clinical use. Much may be learned as to diagnosis and treatment by the use of this method of studying the blood picture. Changes in the percentage of the young polymorphonuclear neutrophils (nonfilaments) often precede changes in the physical signs and symptoms as well as total cell count changes. In the absence of clinical symptoms, nonfilament deviations from the normal should not be ignored. In acute clinical conditions in which the percentage of nonfilamentous neutrophils does not exceed 16, it may be safely assumed that infection is not present. A nonfilament percentage of 50 or over is indicative of a poor prognosis. Failure of the nonfilament percentage to return to the normal level of from 8 to 16 is a sign of persisting infection. The percentage of small lymphocytes is depressed during the acute stage of an infection and rises with recovery, in many instances preceding the onset of convalescence and running parallel with it. The authors believe that because of the ease with which it can be performed and because of its great value to the clinician, the filament-nonfilament count should be adopted as a routine procedure in place of the ordinary differential count.

**Induction of Labor.**—According to Carmichael, multiparas respond to bougie induction of labor in a slightly greater percentage of cases than do primiparas. Multiparas respond to bag induction of labor in a definitely greater percentage of cases than do primiparas. The bag is a more rapid method and a more certain method of inducing labor than is the bougie. The morbidity in bag induction of labor is slightly greater than in the bougie method. The fetal mortality is greater in bag induc-

tion of labor than in the bougie method. The incidence of operative intervention is not increased in labors induced by the bougie method. The operative intervention incident with bag induction of labor is nearly three times as great as in cases induced by the bougie method.

## Military Surgeon, Washington, D. C.

**71:** 1-120 (July) 1932

*Chronic Bronchiectasis. H. P. Marvin.—p. 1.
Comments on Proposed Casualty Clearing Station. J. W. Grissinger.—p. 16.
Rôle of Lipoidal Substances in Complement Fixation: Preliminary Study. W. S. Stone.—p. 61.
Asthma and Hay Fever Clinic, Fort Sam Houston. S. W. French.—p. 67.

**Chronic Bronchiectasis.**—Marvin reports that, although the treatment of bronchiectasis at Fitzsimons General Hospital, Denver, has been conservative, with little experience in the operative procedures now being used at some clinics in the more severe cases, the results have been reasonably satisfactory. Infective foci, especially sinuses, are given early attention. Postural drainage is started at the earliest opportunity and is practiced at least two or three times a day in all cases and as often as every hour in patients severely afflicted. An adjustable table drainage apparatus and a "horizontal bar," or so-called jack-knife drainage method, both of which have their advantages, are used. These appliances were constructed at the hospital, the former having been in use for the past six years and the latter during the past year. The so-called adjustable table method is rather more comfortable for the patient to use but is not as effective in completely emptying the material from the cavities as the "jack-knife drain." The table requires from twenty to thirty minutes as a rule for maximum results, whereas the bar drain requires but three to five minutes and has the advantage of mechanically compressing the lower thorax. These methods of drainage insure a more complete emptying of the bronchiectatic cavities than leaning over the side of a bed or chair, such as must be practiced by the strict bed patient or by patients in their own homes. The important thing is to empty these cavities of secretion as completely as possible and keep them as nearly empty as practicable at all times. Aspiration by means of the bronchoscope is more effective in most cases than the postural method, especially when the secretions in the bronchial dilatations have become very tenacious or so hard and crusted as to require softening by injecting some liquid before suction can remove them.

## Minnesota Medicine, St. Paul

**15:** 455-508 (July) 1932

Medicine and Public Welfare. M. S. Henderson, Rochester.—p. 455.
Acute Appendicitis: Review of Its Symptoms, Diagnosis and Treatment: Statistical Report of Three Hundred and Forty-Six Consecutive Cases of All Types. O. W. Holcomb, St. Paul.—p. 458.
*Perforating Lesions of Large Intestine. J. A. Bargen and F. W. Cox, Rochester.—p. 466.
*Clinical Significance of Melena. J. M. Berkman, Rochester.—p. 469.
United States Public Health Service. Helen H. Hielscher, Mankato.—p. 471.
Certain Types of Diarrhea of Uncertain Etiology. P. W. Brown.—p. 476.
Differential Diagnosis of Jaundice, with Especial Reference to Congenital Hemolytic Jaundice: Report of Case. M. Barron, Minneapolis.—p. 479.
Treatment of Head and Spine Injuries. R. Early, St. Paul.—p. 484.
Development of Transurethral Prostatic Resection. H. C. Bumpus, Jr., Rochester.—p. 489.
Double Uterus and Vagina with Unilateral Atresia. D. A. MacDonald, Minneapolis.—p. 491.

**Perforating Lesions of Large Intestine.**—Bargen and Cox describe their observations in fifty cases of perforating lesions of the large intestine. In the fifty cases the perforations were all due to diverticulitis or to carcinoma. This was confirmed either at operation or at necropsy. Symptoms suggestive of perforation were present in all cases; they differed from those common to the various forms of acute, subacute and chronic obstruction of the colon. Clinical, preoperative and historical data were available in only thirty of the cases of diverticulitis and in nineteen of the cases of carcinoma. In the fiftieth case there was a perforating carcinoma at the splenic flexure and a perforative type of diverticulitis with formation of abscess in the descending colon; thus there were fifty-one lesions in the fifty cases. Pain was the most common symptom, being present in twenty-six of the thirty-one cases of diverticulitis, and ranging in degree from slight pain in eight cases to severe pain which could be classified as acute in twenty-three cases. In thirteen of the cases of carcinoma, pain was severe enough to be called acute; in one case the pain was less severe, and in the other six cases pain was not a prominent symptom. Fever was present in twenty-one cases of diverticulitis; it was associated with chills in nine cases. In ten of the cases, the temperature ranged from 100 to 104 F.; in seven of these it was 102 or more. In twelve cases of carcinoma there was a history of fever; in five it was associated with chills. The temperature in these cases was lower; in only three was it more than 101 F. Vomiting was present in five cases of diverticulitis and in two cases of carcinoma. An abdominal mass was present and palpable in twelve of the cases of diverticulitis and in eight of the cases of carcinoma. In only one of these was the mass palpated by vagina. In one case of diverticulitis, blood was present in the stools at the time of onset of pain, and in one case "inky" stools were passed. In the whole group there were sixteen vesicosigmoid fistulas, only two of which were caused by carcinoma, the other fourteen originating in the perforating diverticulitis. The site of the lesion undoubtedly was a factor in this incidence. In thirty of the cases of diverticulitis the lesion was in the sigmoid, and in only six of the cases of carcinoma was the lesion in the sigmoid. Additional symptoms in these cases were urinary frequency, dysuria, and the passage of blood, pus, feces and gas by the urethra. The duration of these symptoms ranged from two weeks to five years, but in most cases the fistula had been present less than nine months.

**Clinical Significance of Melena.**—Berkman is of the opinion that, in a surgical exploration for the source of gastro-intestinal hemorrhage in which the bleeding lesion is not found, the abdomen should not be closed until the stomach has been opened and explored for intrinsic lesions. In cases of recent hemorrhage, a healed or chronic duodenal ulcer should not necessarily account for the hemorrhage. Infrequently gastro-intestinal hemorrhage occurs from esophageal varices in the presence of cirrhosis of the liver which is impossible to diagnose clinically. The hemorrhage is usually manifested by hematemesis and rarely by melena alone. In all cases of recurrent gastro-intestinal hemorrhage, surgical exploration should be done, and in many cases of indeterminate gastro-intestinal hemorrhage it might be extremely detrimental to the patient not to explore surgically because of only one attack of hemorrhage.

## Nebraska State Medical Journal, Lincoln

**17:** 269-316 (July) 1932

Indications for and Results of Surgical Treatment of Pulmonary Tuberculosis. T. J. Kinsella, Oak Terrace, Minn.—p. 269.
Mechanical Considerations of Inspiration During and Following Operations. C. A. Roeder, Omaha.—p. 275.
Elks Crippled Children's Clinics. F. W. Buckley, Beatrice.—p. 280.
Anterior Poliomyelitis: Diagnosis, Prognosis and Treatment. F. S. Clarke, Omaha.—p. 283.
Spinal Anesthesia. G. C. Kirk, Lincoln.—p. 286.
Hemorrhoids, Their Treatment by Both Operative and Injection Methods, and Results to Be Expected Following Their Treatment. L. E. Moon, Omaha.—p. 289.
Diagnostic and Therapeutic Injection of Sympathetic Nervous System. W. D. Abbott, Des Moines, Iowa.—p. 293.
Report of Delegate to A. M. A. Congress on Medical Education and Hospitals. J. S. Welch, Lincoln.—p. 296.
Early Surgeons and Surgical Operations in Nebraska. H. W. Orr, Lincoln.—p. 300.
Ruptured Aneurysm of Abdominal Aorta Simulating Perforated Gastric Ulcer. E. A. Watson, Grand Island, and R. S. Cram, Burwell.—p. 303.

## New England Journal of Medicine, Boston

**206:** 1281-1330 (June 23) 1932

*Angina Pectoris and Its Treatment. F. M. Howes, New Bedford, Mass.—p. 1281.
Precordial Pain and Tenderness. P. D. White, Boston.—p. 1283.
Mechanism of Edema Formation. F. Fremont-Smith, Boston.—p. 1286.
Drug Treatment of Edema in Congestive Heart Failure. H. D. Henderson, Holyoke, Mass.—p. 1286.
Local Treatment of Edema in Congestive Heart Failure. B. E. Hamilton, Boston.—p. 1290.

**Angina Pectoris.**—In discussing the surgical treatment of angina pectoris, Howes states that three types of operation are performed; namely, cervical sympathectomy, paravertebral injections of alcohol, and the newer operation of dorsal sym-

pathectomy. These operations should be done on carefully selected patients only. The rapidly developing type with the threat of approaching thrombosis should be excluded. If the patient is in good condition, the more extensive operation of dorsal sympathectomy is the one of choice because of the resulting freedom from the annoying numbness and paresthesia that follow alcohol injections. If the patient's condition seems not to warrant so extensive a procedure, injection of the dorsal sympathetic ganglions with alcohol is safe in the hands of the surgeon who is skilful in the technic. The author believes it is not yet fully established whether the operation may not, in addition to preventing the sensation of pain, produce some permanent coronary dilatation and have some nitrite-like effect in preventing the ischemia, which is the cause of the pain. Recently he had a patient who had four years of freedom from pain as the result of cervical sympathectomy but who had terrific pain when he finally developed thrombosis. The author believes that even if some patients die sooner because they do not have the warning that pain gives to overexertion, the mental relief to them to be free from pain and the anticipation of it is well worth a few months of their lives.

**206:** 1331-1382 (June 30) 1932

Surgical Treatment of Pulmonary Tuberculosis. M. H. Joress, Boston.—p. 1331.
*Practical Aspects of Psychiatry for General Practitioner. L. C. Marsh, Worcester, Mass.—p. 1337.
Medical Publicity by Organizations and Individual Physicians. I. Galdston, New York.—p. 1359.
Medical Publicity and Advertising. M. Fishbein, Chicago.—p. 1361.

**Practical Aspects of Psychiatry.**—Marsh points out certain practical aspects of psychiatry applicable to the work of the general practitioner. Because of the failure of many medical schools to teach psychiatry, or to teach it in an engaging fashion, physicians have frequently failed to see the psychiatric implications of their cases. There are practical applications of psychiatry to everyday life. Psychiatry is merely a system of care and treatment for the human personality. Practical psychiatric suggestions are offered for the examining room and bedside in the tasks of history taking, examination, diagnosis and treatment of patients. Attention is called to the psychiatric angle of the common illnesses and surgical conditions.

## New Orleans Medical and Surgical Journal

**85:** 1-82 (July) 1932

Selection of Anesthetic Agent or Method. C. F. McCuskey, Rochester, Minn.—p. 1.
Simplified "Ligation" in Treatment of Appendectomy Stump: Results in Five Hundred Cases. A. B. Carney, Clarksdale, Miss.—p. 9.
Rabbit Ovulation Test in Diagnosis of Pregnancy. E. L. King and J. A. Lanford, New Orleans.—p. 11.
*Significance of Splenomegaly. I. Cohn, New Orleans.—p. 15.
Subphrenic Abscess: Clinical Study. W. S. Kerlin, Shreveport, La.—p. 19.
Treatment of Empyema by Aspiration and Air Replacement. R. R. Roberts, New Orleans.—p. 28.
Tonsillectomy with Some of Its Peculiarities. C. J. Landfried, New Orleans.—p. 31.
Chaulmoogra Oil in Eye, Ear, Nose and Throat. T. J. Dimitry, New Orleans.—p. 36.
Histamine in Asthma. N. F. Thiberge, New Orleans.—p. 39.

**Significance of Splenomegaly.**—Personal experience with a group of cases in which splenomegaly was a prominent manifestation has impressed Cohn with the fact that there are several points which should be of great practical value. Splenomegalies associated with acute febrile reaction are rarely benefited by splenectomy. Splenomegalies associated with lymph node enlargements (Hodgkin's disease, lymphatic leukemia, tuberculosis and syphilis) are not to be considered as surgical cases. Gastric hemorrhages are often allowed to cloud the issue and an unwarranted conclusion is arrived at that the disease is primarily in the stomach when in reality it may be secondary to the engorgement of the portal circulation in the case of polycythemia or late Banti's disease and pernicious anemia. Secondary anemias are often treated without reference to the etiologic factors. If these cases were thoroughly investigated, probably more early splenic anemias would be brought to light. Earlier surgical intervention offers the patient more hope for an eventual recovery. Hemorrhagic purpura is curable in a spectacular way by splenectomy. Serums and calcium salts are of no value in the treatment of true purpura. Splenectomy is not to be considered primarily as the treatment for splenomegalies. Splenomegaly in some instances is the result of diseases which are curable by splenectomy.

## New York State Journal of Medicine, New York

**32:** 773-838 (July 1) 1932

*Herpes Zoster: Report of Case of Palm and Two Fingers, and Fifteen Other Cases, Treated with Pituitrin. H. D. Niles, New York.—p. 773.
Unclassified Acute Anemia with Recovery. N. N. Stark and N. Strauss, New York.—p. 777.
*Effect of Pregnancy on Sugar Tolerance of Diabetics. W. S. Collens and I. E. Shack, Brooklyn.—p. 780.
Trends in Childhood Mortality in New York State (Exclusive of New York City). Elizabeth Parkhurst, Albany.—p. 785.
Hearing Survey, Public Schools, Albany, N. Y. E. M. Freund, Albany.—p. 791.
Oral Focal Infection: Under What Conditions Should Pulpless Teeth Be Removed? H. R. Miller, New York.—p. 796.
Division of Cancer in Department of Hospitals. J. G. W. Greeff, New York.—p. 799.
Hepatic Abscess Due to Reflux of Duodenal Contents Following Cholecystectomy. H. M. Feinblatt, Brooklyn.—p. 801.
*Choice of Instrument in Delivery with Forceps. E. H. Dennen, New York.—p. 802.

**Herpes Zoster.**—Niles reports that of the sixteen patients with herpes zoster whom he treated with solution of pituitary, eleven were well in an average of eight and one-half days, two were improved, two were unimproved, and in one the result was unknown. Of the same number of patients treated by other methods, five were well in an average of eleven days, one was improved, four were unimproved, and in six the result was unknown. The injections of solution of pituitary were given intramuscularly every other day. With the exception of one case, three injections were sufficient; 0.5 cc. was given to elderly patients for the first injection and 1 cc. to the middle aged and younger. All except four patients received 1 cc. at the time of the second and third injection. The author used both surgical and obstetric solution of pituitary. Although the former is considered to be stronger than the latter, he could not see any difference in the results obtained. None of the patients experienced any unfavorable local or general reaction, although several were elderly and suffered from intercurrent diseases. This treatment can be given safely to patients and to those suffering from hypertension, cardiac disease or diabetes. It is not necessary to delay or discontinue the injections because of menstruation, but they should never be given during pregnancy.

**Effect of Pregnancy on Sugar Tolerance of Diabetic Persons.**—According to Collens and Shack, the dextrose tolerance of a pregnant diabetic woman becomes progressively diminished with advancing pregnancy. There occurs in the first few days of the puerperium a transitory period during which the sugar tolerance increases to such an extent that the patient can be considered nondiabetic. This period lasts only from one to three days. The experience of pregnancy seems to reduce permanently the sugar tolerance of a diabetic woman. However, diabetes is not a contraindication to pregnancy alone, for under modern methods of management there are no complications which are intrinsically the result of the diabetic state.

**Choice of Forceps in Delivery.**—Dennen states that in a proper case for delivery with forceps the two essential requirements are an accurate cephalic application and traction in the axis of the pelvis. A correct diagnosis must be made of the amount of molding, position and station of the head, and type of pelvis. Molded heads require a blade with a long, shallow cephalic curve. Axis traction diminishes the amount of effort and injury and is desirable in any station of the head. The large variety of instruments in use shows that there are no universal forceps. In most anterior positions, the Simpson type of blade, with some form of axis traction, is desirable. In most posterior and transverse positions, the Kielland forceps seem to be the choice. Rotation manually, or with the Barton forceps or the solid blades, may be used in some cases. A high transverse head, with a posterior parietal presentation in a flat pelvis, requires the Barton forceps. In face presentations, with the chin posterior, the Kielland forceps, and, on aftercoming heads, the Piper forceps offer advantages. The author describes new traction curve forceps that may be used in anterior positions of the occiput.

## Occupational Therapy and Rehabilitation, Baltimore

**11:** 155-232 (June) 1932

Sublimation in Occupational Therapy. C. P. Oberndorf, New York. —p. 155.
Borzoi: Suggestions for New Rallying of Occupational Therapy. I. C. Marsh, Worcester, Mass.—p. 169.
Altro Workshops: Sheltered Workshop for the Tuberculous. E. Hochhauser.—p. 185.
Applied Psychology in Occupational Treatment. Frances E. Wood, Waverly, Mass.—p. 195.
Organizing Preventorium for Children. Mary P. Diaz, Porto Rico, West Indies.—p. 199.
Occupational Treatment for Crippled Children. Irene Obrock, Oklahoma City.—p. 203.

## Philippine Islands M. Assn. Journal, Manila

**12:** 53-96 (Feb.) 1932

Modern Treatment of Tuberculosis. A. Trepp, Manila.—p. 53.
Nephritis in Filipinos: Clinical Analysis Based on Six Hundred and Fifty-Nine Cases. A. B. M. Sison and M. Ignacio-Makalintal, Manila. —p. 66.
Abdominal Pregnancy at Twenty Months: Report of Case. G. Rustia, Manila.—p. 74.

## Porto Rico J. Pub. Health & Trop. Med., San Juan

**7:** 405-475 (June) 1932

Parasitology in Its Relation to Other Sciences. M. C. Hall, Washington, D. C.—p. 405.
Studies on Cultivation of Parasitic Intestinal Protozoa. H. A. Poindexter, New York.—p. 417.
Nutritional Studies of Foodstuffs Used in Porto Rican Dietary: II. Proximate and Ash Analyses. C. L. Cintrón and D. H. Cook, San Juan.—p. 435.
Isohemagglutination and Blood Grouping: Their Relation to Transfusion: Report of Five Thousand One Hundred and Thirty-Five Blood Groups in Porto Rico. A. Serra, San Juan.—p. 443.
Fusospirochetal Infection of Vagina: Report of Case Occurring in Porto Rico. O. C. Mandry, San Juan.—p. 455.

## Psychiatric Quarterly, Albany, N. Y.

**6:** 191-395 (April) 1932

Treatment of General Paralysis by Radiothermy. L. E. Hinsie and J. R. Blalock, New York.—p. 191.
State Institution Libraries. R. Woodman, Middletown, N. Y.—p. 213.
*Life Tables for Patients with Mental Disease. B. Malzberg.—p. 226.
The Art of Occupational Therapy. H. M. Pollock.—p. 242.
Discussion of Some Topics Illustrating the Internist's Approach to Psychiatric Problems. M. M. Harris, New York.—p. 250.
Psychiatry and the "Psychogalvanic Reflex." C. Landis.—p. 262.
*Use of Sodium Amytal in Treatment of Psychoses. V. F. Murray and Maudie Marie Burns, Poughkeepsie, N. Y.—p. 273.
Sodium Amytal Narcosis as Therapeutic Aid in Psychiatry. R. W. Bohn, Helmuth, N. Y.—p. 301.
*Present Status of One Hundred and Eighty-One Cases of General Paralysis Four or More Years After Treatment with Malaria. A. M. Stanley, Buffalo.—p. 310.
Adjustment Versus Recovery. R. D. Helmer, Utica, N. Y.—p. 314.
Lead Poisoning: Histopathologic Study of Nervous System of Cats and Monkeys in Acute and Subacute Stages. A. Ferraro, New York, and R. Hernandez, Nashville, Tenn.—p. 319.

**Life Tables for Patients with Mental Disease.**—Malzberg presents tables showing that the rates of mortality at corresponding ages are from three to six times as great among patients with mental disease as among the general population. The higher rates of mortality result in a rapid reduction in the life table populations of the patients with mental disease, 25 per cent dying in from 4 to 6 years, 50 per cent in from 13 to 17 years, and 75 per cent in from 28 to 29 years. In the general population, the corresponding periods would be about 32, 48 and 56 years, respectively. Such heavy mortality results in a reduction of approximately 18 years and 14 years in the life spans of the male and female patients, respectively. There are differerences in the direction of the trends of the mortality rates in the early years, rates among patients decreasing, whereas those in the general population increase steadily. The male patients have an expectation of life of 19.17 years at 20 years of age, compared with 18.06 years among females. At 22 years of age, the expectations are 19.02 and 18.18 years for males and females, respectively. In the general population, in 1920, the corresponding expectations at the age of 22 were 41.40 and 42.98 years.

**Use of Sodium Amytal in Treatment of Psychoses.**—Murray and Burns do not feel that sodium amytal affects the fundamental course of psychoses, except in improving the physical condition of the patient by diminishing the activity, and in producing a better contact between the patient and the physician. In their series of cases there is only one in which the course of an acute mania seemed definitely shortened. The authors feel definitely that the main effect of this treatment is to increase the accessibility of the patient, and that the beneficial results, when obtained, are due to some form of psychotherapy made possible by this. The narcosis checks the excitement or removes inhibitions, and enables the patient to get hold of himself to some extent. If, at this point, the physician succeeds in establishing a rapport and maintaining it, good results may be expected.

**Dementia Paralytica.**—Stanley reports the results in 181 cases of dementia paralytica in which the patients were treated by malaria fever therapy from August, 1924, to November, 1927. According to the hospital records in 1931, fifty-two of these patients on discharge had been considered to show complete remission and fifteen partial remission. A complete survey from three to seven years after discharge of the patients with complete or partial remission showed that now only seventeen cases could be considered complete remissions. Eight patients had died, three had been returned to a mental institution, and twenty could not be located. In the seventeen cases of complete remission from three to seven years after discharge, eight of the patients had had follow-up treatment with tryparsamide. The author concludes that many patients discharged from the hospital as in a condition of complete remission tend to show relapses, and that one can get the best results by combining malaria and tryparsamide therapy. One should also make some provision whereby one is sure that these patients discharged from the hospital will be properly supervised and treated over a period of at least three years, as it is pretty generally accepted that cases showing positive serologic changes, though clinically a remission, tend to relapse unless treated.

## Southern Medical Journal, Birmingham, Ala.

**15:** 679-784 (July) 1932

One Hundred and Twenty-Six Cases of Ovarian Carcinoma Treated by Radiation. W. Neill, Jr., Baltimore.—p. 679.
Treatment of Peptic Ulcer by Resection of Stomach. B. Brooks, Nashville, Tenn.—p. 682.
Neuro-Anemic Syndrome: Addison-Biermer Type of Anemia with Incipient Funicular Myelopathy Treated by Parenteral Administration of Liver Extract (Gänsslen; Castle). L. F. Barker, Baltimore. —p. 687.
Abdominal Symptoms in Manifest Heart Disease. E. F. Horine and M. M. Weiss, Louisville, Ky.—p. 692.
Carcinoma of Prostate: Clinical and Pathologic Study. J. A. C. Colston and L. G. Lewis, Baltimore.—p. 696.
Conservative Management of Commoner Complications of Pregnancy. S. C. Cowan, Nashville, Tenn.—p. 704.
Early (Subclinical) Syphilitic Aortitis: Evaluation of Radiographic Diagnostic Methods. C. G. Blitch, Jacksonville, Fla.; H. J. Morgan and H. T. Hillstrom, Nashville, Tenn.—p. 709.
Syphilis of Heart and Aorta: Report of One Hundred Cases with Autopsy Observations. O. S. Warr, Memphis, Tenn.—p. 711.
Syphilis of Stomach: Report of Case Treated with Bismuth. E. L. Rice and L. M. Blackford, Atlanta, Ga.—p. 717.
Cosmetic Eruptions. E. S. Lain, Oklahoma City.—p. 718.
Obstructive Dyspnea: Bronchoscopic Observations; Types, with Illustrative Cases. G. Tucker, Philadelphia.—p. 723.
Successive Bronchial Foreign Bodies. C. N. Peeler and V. K. Hart, Charlotte, N. C.—p. 729.
Treatment of Essential Hypertension by Roentgen Radiation of Medulla Oblongata. W. M. Yater, F. O. Coe and I. Rodis, Washington, D. C.—p. 730.
Special Medical Problems of Colored Woman. C. J. Miller, New Orleans.—p. 733.
Fractures of Shaft of Femur. S. O. Black, Spartanburg, S. C.—p. 739.
Fractures of Pelvis. G. W. Leadbetter, Washington, D. C.—p. 742.
Hernia in Railway Surgery. E. T. Newell, Chattanooga, Tenn.—p. 746.
Primary Ophthalmic Tularemia: Report of Five Cases with Pathology of Eye. R. M. Armstrong and C. N. Kavanaugh, Lexington, Ky. —p. 749.
Headache and Brain Tumor. G. Anderson, New Orleans.—p. 752.
Indolic Autointoxication. J. R. Verbrycke, Jr., Washington, D. C.— p. 754.
Anorexia: Daily Clinical Problem. W. Quillian, Miami, Fla.—p. 759.
Dental Conditions in Children: Their Importance to Pediatrist. C. B. Bray, Birmingham, Ala.—p. 763.
Service of State to Local Health Departments. H. S. Mustard and W. K. Sharp, Jr., Nashville, Tenn.—p. 766.
Congenital Absence of Part of Abdominal Wall. H. A. Gamble, Greenville, Miss.—p. 771.
Laboratory Aids in Diagnosis of Typhoid and Related Fevers. G. A. Denison, Birmingham, Ala.—p. 772.
Postgraduate Study of Pediatrics. D. L. Smith, Spartanburg, S. C. —p. 773.
Hospital Policies and Pocketbooks. B. C. MacLean, New Orleans.— p. 776.

## Southwestern Medicine, Phoenix, Ariz.

**16:** 233-272 (June) 1932

President's Address. C. Gunter, Globe, Ariz.—p. 233.
Country Doctor of the Future. F. D. Vickers, Deming, N. M.—p. 236.
*Immunization Against Diphtheria. M. S. Gaede, Jerome, Ariz.—p. 238.
Industrial Surgery and Industrial Commission. B. H. Clingan, Phoenix, Ariz.—p. 245.
Rupture of Pregnant Uterus in Trial Labor, with Previous Cesarean Scar Intact: Case. C. E. Yount, Prescott, Ariz.—p. 252.

**Immunization Against Diphtheria.**—Gaede records results obtained with diphtheria toxoid in the active immunization against diphtheria and compares them with those obtained with toxin-antitoxin. In 103 Schick-positive children, three injections at weekly intervals of commercial toxin-antitoxin produced 68 per cent negative Schick reactions from three to six months after the final injection. In 504 Schick-positive individuals, two injections of diphtheria toxoid at intervals of from three to four weeks gave a negative Schick test from two to three months after the last injection in 86.2 and 93.1 per cent of the cases. In 112 preschool children, two injections of diphtheria toxoid produced a negative Schick test in only 76 per cent. The reason for such a low immunity response in this group has not been definitely determined. The advantages of diphtheria toxoid over toxin-antitoxin in the prophylaxis of diphtheria are threefold: (1) the larger percentage of negative Schick tests obtained after the injections of the material, with a greater rapidity of establishing this immunity; (2) the avoidance of possible serum sensitization in the subject immunized, and (3) the greater stability of the preparation and its absolute innocuousness. The disadvantage of diphtheria toxoid, compared with toxin-antitoxin, lies chiefly in the questionably more frequent occurrences of local and general reactions resulting from the injections. This, however, can be obviated by excluding those individuals who show a strong pseudoreaction to the Schick test and those who are positive to the intradermal injection of the diluted toxoid. The author regards as essential the routine employment of the Schick test two or three months after the completion of the immunization. Any program of diphtheria prevention must include and especially emphasize the necessity of immunizing the preschool child. In conclusion the author states that the use of diphtheria toxoid as an immunizing agent in the prophylaxis of diphtheria is highly recommendable, and, in children, is to be preferred to toxin-antitoxin.

## Surgery, Gynecology and Obstetrics, Chicago

**55:** 1-128 (July) 1932

*Peptic Ulcers and Interbrain. H. Cushing, Boston.—p. 1.
Geographic Pathology of Goiter. C. A. Hellwig, Wichita, Kan.—p. 35.
New Method for Graphically Recording Contractions of Parturient Human Uterus: Study of Effect of Certain Sedatives, Anesthetics and Stimulants on Uterus in Labor. S. M. Dodek, Cleveland.—p. 45.
Hepatolienography with Thorotrast. R. Lewisohn, New York.—p. 68.
*Relation of Pyogenic Arthritis to Osteomyelitis. J. D. Bisgard, Chicago.—p. 74.
Shelf Operation in Treatment of Congenital Dislocation of Hip. F. D. Dickson, Kansas City, Mo.—p. 81.
Wire Extension Treatment of Fractures of Fingers and Metacarpal Bones. H. Meltzer, Frankfort-on-Main, Germany.—p. 87.
*Pancreatic Lithiasis. F. D. Ackman and A. Ross, Montreal, Canada.—p. 90.
Knotting of Umbilical Cord: Report of Two Cases and Illustrations of Mechanism of Knot Formation. W. G. Atwood, Fall River, Mass.—p. 96.
Electrohemostasis in Place of Ligatures: Presentation of Small, Simple Apparatus for Electrocoagulation. H. H. Young, Baltimore.—p. 100.
Relation of Diverticula of Bladder to Obstruction of Vesical Neck. W. Walters and S. W. Mulholland, Rochester, Minn.—p. 104.
Primary Malignant Neoplasms of Epididymis. C. A. Coleman, J. A. Mackie and W. M. Simpson, Dayton, Ohio.—p. 111.

**Peptic Ulcers and Interbrain.**—The attempt to find a reasonable explanation for the acute perforative lesions affecting the esophagus, stomach and duodenum, which in three instances caused early fatality after operations for cerebellar tumor, led Cushing not only to a review of the extensive literature on the neurogenic aspects of ulcer pathogenesis but also to certain experimental observations that strongly suggest the presence in the diencephalon of a parasympathetic center. From this center, apparently tuberal in situation, fiber tracts pass backward to relay with the cranial autonomic stations of midbrain and medulla, of which the vagal nucleus is by far the most important because of its influence on the activity of the lungs, heart and upper alimentary canal. Experimental lesions anywhere in the intracranial course of these fiber tracts from anterior hypothalamus to vagal center, presumably from parasympathetic stimulation (or possibly from vagal release due to sympathetic paralysis), are prone to cause gastric erosions, perforations or ulcers. Intracranial injuries and diseases affecting these basilar regions of the brain are known to be accompanied by ulcerative lesions of the upper alimentary canal. It is reasonable to believe, therefore, that the perforations following the cerebellar operations forming the basis of the author's study were produced in like fashion by an irritative disturbance either of fiber tracts or of vagal centers in the brain stem. The author points out that those favorably disposed toward the neurogenic conception of ulcer have in the course of time gradually shifted the burden of responsibility from the peripheral vagus to its center in the medulla, to the midbrain, and now to the interbrain, newly recognized as a highly important, long overlooked station for vegetative impulses easily affected by psychic influences. So it may easily be that high strung persons, who incline to the form of nervous instability classified as parasympathetic (vagotonic), through emotion or repressed emotion, incidental to continued worry and anxiety and heavy responsibility, combined with other factors such as irregular meals and excessive use of tobacco, are particularly prone to have chronic digestive disturbances with hyperacidity often leading to ulcer—effects wholly comparable to those acutely produced by irritative lesions experimentally made anywhere in the course of the parasympathetic system from the tuberal center to its vagal terminals. While this conception of the etiology of ulcer does not account for all ulcerative processes under all conditions, it offers a reasonable explanation of the majority of them and is in accord with the personal experience of most victims of chronic recurring ulcer. This, briefly, is as near as one can come, with the data at hand, to an interpretation of the neurogenic origin of peptic ulcer and an explanation of its existing prevalence.

**Relation of Pyogenic Arthritis to Osteomyelitis.**—Bisgard reports that of 217 cases of pyogenic osteomyelitis there was associated arthritis in 41 cases, an incidence of 23.5 per cent. Of these 51 cases, 42 (19.3 per cent) arose by direct extension from an adjacent diaphyseal infection. The large weight bearing joints constituted 92.5 per cent of this group. In 9 cases (4.1 per cent) the joints appeared to have become involved by blood-borne infections, presumably from remote foci of osteomyelitis. However, there may have existed at some time a small undiscovered lesion in the adjacent bone, and the joints may represent the end-result of an abortive osteomyelitis. The seriousness of this complication of osteomyelitis was measured in this analysis by the end-results of the joint damage alone. Only 13.2 per cent of joints infected by direct extension regained a good range of motion; 65.2 per cent became ankylosed, and the remaining 22.6 per cent suffered varying degrees of functional limitation. A comparison of these end-results with those resulting from hematogenous infection, in the small series analyzed, suggests that less joint damage is produced by the latter type. In this group ankylosis occurred in 44.5 per cent and a good range of motion was preserved in 33.3 per cent of the cases.

**Pancreatic Lithiasis.**—According to Ackman and Ross, pancreatic lithiasis, of which they report a typical case, has been reported only slightly over 100 times. Whereas most of the earlier cases reported were from necropsy observations, in the majority during the last fifty years successful operations have been performed. Epigastric pain of both dull and colic-like nature is the commonest symptom, but unfortunately there is no consistency in radiation. Steatorrhea and diarrhea attract particular attention in the symptomatology. These symptoms, together with the occasional finding of calculi in the feces, make the examination of the stools of great importance. Glycosuria of true diabetic character is a frequent observation late in the condition. It appears to be coincident with extensive destruction of the islets of Langerhans by the fibrotic pancreatitis that occurs with this condition. Jaundice occurs often enough to lead frequently to the incorrect diagnosis of cholelithiasis. Correct clinical diagnosis is difficult, and though the roentgen ray is of great value it may not be conclusive, while even at operation stones may be missed, particularly if single.

A peculiar crepitus when multiple stones are present has been described. Surgical treatment has yielded gratifying results from every standpoint. The mortality rate is less than 6.5 per cent. When properly treated, diabetes mellitus does not constitute a contraindication to operation. Characteristic pathologic changes occur in the parenchyma of the gland, beginning as a chronic interlobular pancreatitis and gradually involving the whole gland in a fibrotic process, with resultant atrophy and loss of parenchyma. The islets of Langerhans are last to be involved. The calculi are composed for the most part of calcium carbonate and calcium phosphate. These observations are suggestive of an inflammatory etiology. Associated pulmonary tuberculosis has been noted in a number of cases. The incidence of this is, however, probably not more than might be expected in diabetes mellitus generally.

## Texas State Journal of Medicine, Fort Worth

**28:** 195-252 (July) 1932

Rheumatic Fever and Rheumatoid Arthritis. J. W. Gray, E. Fendrick and C. H. Gowen, Newark, N. J.—p. 203.
Importance of Early Diagnosis and Treatment of Lesions of Oral Cavity. A. Soiland, Los Angeles.—p. 213.
Antistreptococcus Cardioarthritidis Serum and Antigen (S. C. A.) in Treatment of Chronic Rheumatic Endocarditis: Preliminary Report. M. B. Whitten, Dallas.—p. 217.
Possible Significance of O and H Agglutinins, with Especial Reference to Widal and Weil-Felix Reactions. H. A. Kemp, Dallas.—p. 223.
Common Intra-Ocular Tumors. B. F. Payne, Houston.—p. 227.
Industrial Ophthalmologic and Compensation Problem. J. G. Jones, Dallas.—p. 231.
The Physician and His Ethics. J. H. Hunter, Houston.—p. 238.

## Virginia Medical Monthly, Richmond

**59:** 197-262 (July) 1932

Preliminary Report of Method of Internal Fixation of Transcervical Fractures of Neck of Femur in the Aged. H. H. Westcott, Roanoke.—p. 197.
*Treatment of Depressed Fractures of Vault, and Prevention of Intracranial Infection in Certain Fractures of Base of Skull. C. C. Coleman, Richmond.—p. 204.
Radiotherapy in Nonmalignant Conditions. C. Moore, Washington, D. C.—p. 207.
Difficulties in Diagnosis of Atypical Cases of Pulmonary Tuberculosis. F. B. Stafford, Sanatorium.—p. 212.
Health Work in Norfolk Public Schools. W. L. Harris, Norfolk.—p. 229.
Unusual Case of Peritonitis. W. L. Peple, Richmond.—p. 231.
Cardinal Principles in Treatment of Asthma and Hay Fever. W. E. Jennings, Danville.—p. 233.
Some Thoughts on Appendicitis. F. J. Kirby, Baltimore.—p. 236.
Arthritis. J. S. Gaul, Charlotte, N. C.—p. 238.
Leptothrix Buccalis Infection. T. L. Driscoll, Richmond.—p. 240.

**Treatment of Depressed Fractures of Vault.**—Coleman points out that the prevention of epilepsy and headache following depressed fractures of the skull is more likely to succeed if, in addition to the elevation or removal of depressed fragments, such treatment of the injured brain is carried out as will limit the amount of cortical scar tissue. The treatment of the local brain injury underlying the depressed fracture is of greater importance than the mere elevation of the depressed bone. Compound fractures of the vault require early operation to prevent infection of the brain and to minimize the late bad effects of the local injury. The author believes that the principles of surgical treatment of compound fractures of the vault for prevention of infection should be extended to certain fractures of the base, in which there is a communication between the meningeal spaces and the sinuses, as shown by a continued cerebrospinal fluid leak or air remaining in the brain tissues and cerebrospinal fluid spaces.

## West Virginia Medical Journal, Charleston

**28:** 289-336 (July) 1932

President's Annual Address: Medical Retrospect. A. H. Hoge, Bluefield.—p. 289.
Some Phases of Healing Process in Tuberculosis. C. H. Cocke, Asheville, N. C.—p. 296.
Reduction of Fractures with Local Anesthetics. R. H. Walker, Charleston.—p. 302.
Public Health, Its Meaning, History, Early Problems and Modern Accomplishments. A. J. Kemper, Clarksburg.—p. 305.
Local Use of Chloroform in Various Pain and Allied Conditions. C. N. Brown, Swandale.—p. 309.
The Physician Himself. N. R. Price, Marlinton.—p. 311.
Agranulocytosis Associated with Diabetes: Case. W. M. Sheppe, Wheeling.—p. 313.

# FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Archives of Disease in Childhood, London

**7:** 105-180 (June) 1932

Investigations on Causes of Vaccination Encephalitis. A. Eckstein.—p. 105.
*Amyoplasia Congenita. W. Sheldon.—p. 117.
Osteopsathyrosis (Lobstein's Disease). Constance M. Ottley.—p. 137.
*Plasma Phosphatase in Rickets and Scurvy. Jean Smith and M. Maizels.—p. 149.
*Acute Otitis Media in Infancy. N. Asherson.—p. 159.
Influence of Acidosis on Carbohydrate Metabolism. Mary L. Gilchrist.—p. 169.

**Amyoplasia Congenita.**—Sheldon points out that the name "multiple congenital articular rigidity" sums up the leading clinical characteristics of amyoplasia congenita, once seen the recognition of other cases should be easy. It is to be remembered that the position in which individual joints may be fixed may vary in different cases, as may the range of movement. The only other disease with which it might be confused is spastic diplegia due to lesions of the nervous system, but in that condition the stiffness of the limbs can be slowly overcome by passive means and there is no actual fixity of the joints. Also the spasticity relaxes under anesthesia. Cases presenting fixed extension of the elbows, pronation of the forearms, and flexion of the wrists, bear a resemblance to Erb's type of brachial palsy, but in the latter condition the arms are flail and there is no ankylosis of joints. The rigidity is greatest at birth; it may persist undiminished, but by constant efforts at passive movements carried out over months or years, some increase in the range of mobility may be obtained. Major orthopedic operations have been undertaken in some of the cases with apparently good results, particularly in the cases of fixed flexion of the knees.

**Plasma Phosphatase in Rickets and Scurvy.**—According to Smith and Maizels, the chemical changes in rickets and scurvy are to some extent contrasting, as might be expected from the other pathologic changes in these conditions. In rickets there is excessive proliferation of cartilage cells, increased vascularity, and the formation of a wide zone of osteoid tissue. The high phosphatase found in rickets is probably derived from these hypertrophic cartilage cells and osteoblasts which Robison has shown to be the source of the enzyme, and its presence in increased quantity supplies one of the factors essential for ossification. In scurvy, on the other hand, the picture is one of cessation of growth, and ossification is in abeyance. The cartilage cells are disorganized and are fewer in number and smaller in size than normal. Hence, in the acute stage there is neither the source nor the need for the production of phosphatase. This holds good also in cases with subperiosteal hemorrhage before calcification begins. With the administration of antiscorbutic vitamin, growth begins again and calcification of any hemorrhage present proceeds; the cartilage cells become active and the plasma phosphatase rises, corresponding to a probable increase in the secretion of phosphatase in the bone. The observations in cases of fractures agree with these conclusions. The author found the average normal plasma phosphatase in infants under 1 year to be 0.23 unit (range 0.10 to 0.27). In the second year the figures were slightly higher, averaging 0.24 unit (range 0.11 to 0.33), while the phosphatase content in older children up to 12 years of age averaged 0.17 unit (range 0.12 to 0.2). The plasma phosphatase is increased in active rickets, the degree of elevation corresponding to the severity of the disease. The average phosphatase in nine cases of uncomplicated rickets was 0.75 unit, with a range of 0.3 to 1.4. Whereas the blood calcium and phosphorus rapidly returned to normal with treatment, the decline in the phosphatase was much more gradual, and normal values were not regained until the healing process was complete. The phosphatase was found to give low normal figures in the acute stage of scurvy whether subperiosteal hemorrhages were present or not. A rise of the phosphatase appeared coincident with the onset of calcification of the hemorrhages and this fell again with the absorption of these calcified areas. The plasma phosphatase was normal in cases of fracture immediately after the injury but rose at the same time as the callus appeared and fell to normal when the bone was completely healed.

**Acute Otitis Media in Infancy.**—Asherson states that in an infant the tympanic membrane may remain of apparently normal color and yet have pus behind it. A temperature of over 100 F. with an unruptured tympanic membrane, during an attack of acute otitis media, even though such a figure has been reached only once during the illness, indicates the presence of a suppurative lesion, demanding myringotomy without delay. Even if the patient is not seen until a late stage of the attack when only a mild degree of fever is present, the same conclusions should be drawn if there is a clear history of an earlier temperature of over 100 F. The presence of high fever in an infant, even in the new-born, should lead to a suspicion of acute otitis media calling for a careful examination of the ears. In cases of infantile gastro-enteritis the ears should be kept under the observation of the otologist. If myringotomy reveals pus, the antrum should be drained.

## British Journal of Experimental Pathology, London

**13:** 189-298 (June) 1932

Hydrogen Ion Concentration of Fowl's Blood in Rous Sarcoma and in Infections (Avian Tuberculosis and Salmonellosis). M. J. A. des Ligneris.—p. 189.
Cortical Proliferation in Mouse Suprarenal After Peptone. R. Whitehead.—p. 200.
Production of Toxin by C. Diphtheriae: I. Energy Sources. C. G. Pope.—p. 207.
Id.: II. Effects Produced by Additions of Iron and Copper to Medium. C. G. Pope.—p. 218.
Intranuclear Bodies in Liver Cells of Mice. G. M. Findlay.—p. 223.
Transmission of Luping Ill to Monkeys. G. M. Finlay.—p. 230.
Studies on Protein-Free Suspensions of Viruses: IV. Antigenic Properties and Serologic Reactions of Protein-Free Suspensions of Phage. I. J. Kligler and L. Olitzki.—p. 237.
Antihemolysin Titers in Hemolytic Streptococcal Infections and Their Significance in Rheumatic Fever. E. W. Todd.—p. 248.
Nature of Vaccinia Flocculation Reaction and Observations on Elementary Bodies of Vaccinia. J. Craigie.—p. 259.
Mucus Secretion in Trachea. H. Florey, H. M. Carleton and A. Q. Wells.—p. 269.
Studies in Bacillus Pestis Antigens: I. Antigens and Immunity Reactions of Bacillus Pestis. H. Schütze.—p. 284.
Id.: II. Antigenic Relationship of Bacillus Pestis and Bacillus Pseudotuberculosis Rodentium. H. Schütze.—p. 289.
Id.: III. Prophylactic Value of Envelope and Somatic Antigens of Bacillus Pestis. H. Schütze.—p. 293.

## British Medical Journal, London

**1:** 1063-1110 (June 11) 1932

*Alteration of Circulation of Brain by Surgical Means in Diseases of Central Nervous System. N. D. Royle.—p. 1063.
Liver and Spleen: Their Clinical and Pathologic Associations. J. W. McNee.—p. 1068.
*Recent Advances in Treatment of Fractures. R. W. Jones.—p. 1073.
Disruption of Pelvis. L. A. H. Snowball.—p. 1076.
Spontaneous Cure of Spina Bifida with Congenital Dislocation of Lumbar Spine. D. Kyle.—p. 1076.
Removal of an Ascaris from Common Bile Duct. J. B. G. Muir.—p. 1077.

**Alteration of Circulation of Brain by Surgery in Diseases of Central Nervous System.**—Royle says that it is a well known principle underlying the physiology of the central nervous system that hyperactivity accompanies slight degrees of asphyxia or anoxemia. The operation of this principle suggested itself to him when he had observed the results following a sympathetic thoracic trunk section on a patient with extensor spasm. He was demonstrating the ipsilateral effects showing how the ipsilateral forearm fell when released from the perpendicular position, when to his surprise the contralateral forearm fell much more rapidly. The operation of sympathetic thoracic trunk section profoundly alters the cerebral circulation, and the result he had observed was explained by the change in circulation in the opposite side of the brain. It then occurred to him that in paralysis agitans, spastic hemiplegia, and other conditions, he had been operating on the side of the manifestation of the lesion instead of on the side of the lesion in the brain. This reflection opened up a new aspect of the surgery of the sympathetic nervous system—that of changing the reflex activity of the central system by altering the blood supply of the brain rather than attempting to change its peripheral manifestations by cutting peripherally directed rami of the sympathetic nervous system. The author presents an account of the technic and results of sympathetic thoracic trunk section in various surgical operations and laboratory experiments.

**Treatment of Fractures.**—Jones predicts that in consequence of the advances made in the treatment of fractures the "massage" departments of hospitals will undergo a great transformation during the next few years. A patient with a fractured limb can be persuaded that it is safe to use it only if he is taught occupational activity under supervision. In the author's physical therapy department at the Liverpool Royal Infirmary the number of patients who are actually being massaged is reduced to a negligible minimum. But every patient goes into the department as soon as roentgenograms have shown that the fracture is perfectly reduced. The man whose Pott's fracture was reduced yesterday is today being taught to walk. The woman who sustained a Colles fracture yesterday is today learning to make beds and peel potatoes. As far as possible, individual occupational activity is maintained throughout the period of immobilization. The patient with the fractured spine, whose trunk is encased in plaster, is taught exercises for the erector spinae, which are far more effective than faradic stimulation, even if such were possible. Every patient whose knee joint is immobilized, whether he walks or not, is taught tonic exercises for the quadriceps, and if a patient is due for admission to a hospital for a knee operation he is first taught quadriceps drill until he is so expert in his exercise that he can practice it from the day of operation onward. In short, modern treatment anticipates the complications of muscle wasting, joint stiffness and mental fear, and instead of treatment being prescribed after these conditions have developed, steps are taken to prevent them from appearing.

**1:** 1111-1156 (June 18) 1932

Liver and Spleen: Their Clinical and Pathologic Associations. J. W. McNee.—p. 1111.
*Prognostic Value of Spinal Anesthesia in Vasospastic Diseases of Lower Limbs. E. D. Telford and J. S. B. Stopford.—p. 1116.
Artificial Pneumothorax, Adhesion Cutting and Oleothorax: Illustrative Case. F. G. Chandler.—p. 1118.
*Action of Ergot Preparations on Puerperal Uterus: Clinical Investigation, with Especial Reference to Active Constituent of Ergot as Yet Unidentified. C. Moir and H. H. Dale.—p. 1119.
Use of "Avertin" in Presence of Damaged Liver Function: Report of Three Illustrative Cases. H. K. Ashworth.—p. 1123.
Erysipelas Treated by Milk Injections: Four Cases. A. C. McEachern.—p. 1124.

**Prognostic Value of Spinal Anesthesia in Vasospastic Diseases of Lower Limbs.**—Telford and Stopford say that in any case of thrombo-angiitis obliterans there is the element of vasospasm, which can be relieved by cord sympathectomy, and there is the element of thrombosis, on which operation is useless. The propriety of operating can be decided only by an endeavor to estimate the relative amounts of spasm and thrombosis. The authors feel that this can best be done in the lower limbs by a spinal anesthetic. The method need involve no trouble for the patient, as the spinal injection is given on the operating table and the operation can be undertaken or abandoned on the observations given by the thermometer within five minutes of the injection. These advantages render this method much more attractive, safer, and quicker than those involving the intravenous injection of substances which commonly cause the patient discomfort for some time. Furthermore, the response to a spinal anesthetic gives an accurate record of what can be expected from sympathectomy, while the rise in surface temperature induced by fever only approximates roughly to that following excision of the sympathetic supply.

**Action of Ergot Preparations on Puerperal Uterus.**—According to Moir and Dale, the liquid extract, and the solid extract of ergot, of the 1914 British pharmacopeia, both show great activity in stimulating contractions in the puerperal uterus. Defatted ergot powder has a similar action. The keeping properties of the extracts appear to be good. Different samples of ergot vary in their activity. The effect of the drug comes on with remarkable suddenness and may appear within four minutes of oral administration of the liquid extract. There is an increased tone of the uterus to an extent much greater than that seen with other oxytocic drugs. In these and other respects the ergot extracts act in a far different manner from the purified alkaloids ergotoxine and ergotamine. Histamine and tyramine, given in reasonable dosage by the mouth, have no effect on the puerperal uterus. Histamine given

by intramuscular injection has slight effect on the uterus but may produce undesirable symptoms. There is reason to believe that the characteristic and traditional effect of ergot is due to a substance as yet unidentified.

## East African Medical Journal, Nairobi

**9:** 1-28 (April) 1932

*Note on Laboratory Diagnosis of Plague Infections. F. P. G. de Smidt.—p. 2.
Use of Calcium in Heart Disease. E. Podolsky.—p. 14.
List of Muscidae and Oestridae Causing Myiasis in Man and Animals in Kenya, Recorded at Medical Research Laboratory, Nairobi. C. B. Symes and J. I. Roberts.—p. 18.

**9:** 29-57 (May) 1932

Preliminary Note on Cell Content of Prefrontal Cortex of East African Native. F. W. Vint.—p. 30.

**Laboratory Diagnosis of Plague Infections.**—De Smidt points out that, in the human subject during life, laboratory diagnosis of plague infections depends on either microscopic or cultural examination, or both together, of the following materials: (1) lymph node substance obtained by needling of a bubo; (2) blood withdrawn from a vein for culture, or merely a drop of blood for a slide, and (3) sputum. Examination of lymph node substance is of course restricted to bubonic cases or those in which enlarged lymph nodes can be found. Blood culture is not very likely to yield growth of bacilli except in the markedly septicemic type of case, and then the positive result may be obtained only perhaps two or three days after the patient's death. Microscopic examination of an ordinary blood slide may give a rapid diagnosis but again is likely to be positive only in a severe septicemic case. Microscopic examination of sputum may afford a quick and certain diagnosis in a septicemic case with bronchopneumonic involvement of lung in which differentiation is to be made from common pneumonia. The author describes in detail these various forms of laboratory diagnosis.

## Indian Medical Gazette, Calcutta

**67:** 301-360 (June) 1932

Study of Monkey-Malaria: Its Experimental Transmission to Man: Preliminary Report. R. Knowles and B. M. das Gupta.—p. 301.
Preliminary Note on Antirachitic Value of Sun-Irradiated Yeast. D. C. Wilson.—p. 320.
Musk: Its Pharmacologic Action and Therapeutic Uses. R. N. Chopra and B. Mukherjee.—p. 321.
Observations on Composition of Butter Imported into Burma. E. H. Bunce.—p. 326.
Contribution to Surgery of Fascial Transplantation: Illustrative Cases. P. C. Dutta.—p. 326.

## Journal of Physiology, London

**75:** 113-271 (June 21) 1932

*Physiologic Leukocytosis: Variation in Leukocyte Count During Rest and Exercise, and After Hypodermic Injection of Adrenalin. H. E. Martin.—p. 113.
Normal Respiration and Influence of Vagi. E. Sharpey-Schafer.—p. 130.
Creatine and Phosphorus Compounds in Malignant Tumors. E. Boyland.—p. 136.
*Vasodilator Fibers in Sympathetic, and Effect of Circulating Adrenalin in Augmenting Vascular Response to Sympathetic Stimulation. J. H. Burn.—p. 144.
Identification of Gamma Excitability in Muscle. W. A. H. Rushton.—p. 161.
Effect of Injection of Blood on Urea in Blood and Urine. E. S. Ivanitzky-Vassilenko.—p. 190.
Lactic Acid Metabolism of Frog's Muscle Poisoned with Iodoacetic Acid: I. Lactic Acid Metabolism of Anerobic Iodoacetate Muscle: II. Lactic Acid Metabolism of Aerobic Iodoacetate Muscle. C. A. Mawson.—p. 201.
Reversal of Gastric Vagus. G. L. Brown and R. C. Garry.—p. 213.
Chloride and Vapor-Pressure Relations in Secretory Activity of Gills of Eel. J. B. Bateman and A. Keys.—p. 226.
Portal Circulation: I. Action of Adrenalin and Pituitary Pressor Extract. J. McMichael.—p. 241.
Influence of Shortening on Heat Production of Frog's Gastrocnemius. M. Cattell.—p. 264.

**Physiologic Leukocytosis.**—Martin examined the diurnal variation of the leukocyte count during rest and found that the counts are steadiest and at a minimum when the patient's condition approximates most nearly that of absolute physiologic rest; that they rise with increase in the mental and physical activity of the subject, and that they tend to rise in the late afternoon and early evening, this being regarded as the period of greatest activity. The effect of exercise on the peripheral blood was investigated. The total leukocyte count exhibited a rise varying from 15 to 48 per cent of the resting value, and it returned to normal after about thirty minutes' rest. Further exercise then produced another rise in the count similar in type and degree to the first. The rise in the total count was due to an increase in the number of all types of cell, but the lymphocytes showed the greatest increase. The hypodermic injection of epinephrine is followed by a leukocytosis in which all types of cell show an increase, but that of the lymphocytes is most marked. It is similar to the leukocytosis following exercise, and the author advances the theory that the latter is produced by autogenously secreted epinephrine. The cells that cause the leukocytosis arise from two sources. The lymphocytes are in all probability derived from the lymph nodes which contract under the influence of the epinephrine, and the granular cells are washed out of the bone marrow by the increased blood flow due to cardiac stimulation by the epinephrine.

**Sympathetic Vasodilators and Epinephrine.**—Burn describes experiments in which he demonstrated the existence of vasodilator fibers in the lumbar sympathetic chain of the dog. He also demonstrated that both the magnitude of the vasodilator response and the magnitude of the vasoconstrictor response to sympathetic stimulation are dependent on the amount of epinephrine in the circulating blood.

## Journal of State Medicine, London

**40:** 373-434 (July) 1932

Modern Legislative Tendencies in Public Health. L. L. Macassey.—p. 399.
Progress of Industrial Hygiene in Northern Ireland. T. Somerset.—p. 406.
Improvement of Workers' Health Through Industrial Management. Melchett.—p. 409.
Maternity and Child Welfare. Craigavon.—p. 415.

## Journal of Tropical Medicine and Hygiene, London

**35:** 177-192 (June 15) 1932

Diseases of Australian Aborigines. H. Basedow.—p. 177.
Present Problem of Malaria in Natal. F. G. Cawston.—p. 185.
Sodoku (Rat-Bite Disease) and Its Incidence in Brazil: Brief Report of New Case. H. P. Fróes.—p. 185.

**35:** 193-208 (July 1) 1932

Diseases of Australian Aborigines. H. Basedow.—p. 193.
Investigations on Malaria and Its Transmission in Amoy, Fukien Province, South China. Lan-Chou Feng.—p. 198.

## Lancet, London

**1:** 1345-1394 (June 25) 1932

*Reactions of Eye to General Disease. F. A. Williamson-Noble.—p. 1345.
*Asbestosis Body. S. R. Gloyne.—p. 1351.
Results of So-Called Tonsils and Adenoids Operation. J. K. Love.—p. 1356.
Reduction of Fractures Under Local Anesthesia. E. L. Bartleman and G. O. Tippett.—p. 1357.

**Reactions of Eye to General Disease.**—Williamson-Noble points out that the changes in the eye associated with high blood pressure are of great clinical importance. The retina is morphologically a portion of the brain and, from the clinical standpoint, it is the condition of the cerebral circulation which most closely concerns one in cases of vascular disease. In the second place, the eye is the only portion of the body where the cerebral vessels are, so to speak, open to inspection; and the dioptric arrangements are such as not only to render the vessels visible but actually to magnify them 14 diameters. It is not surprising, therefore, that the ophthalmologist, by his routine examination of the fundus, is often the first person to discover the presence of vascular disease. The retinal circulation is a little unusual in that the larger vessels, although morphologically arteries, resemble arterioles in the thinness of their walls and the paucity of their muscular layer. The first and most important change, to the author's mind, is localized variation in caliber. The condition is not by any means conspicuous and, unless carefully sought, may be overlooked. The author has seen definite nipping of the superior temporal vein by the artery in perfectly healthy children, and he has seen no nipping at all in cases in which the systolic blood pressure was over 200 mm. of mercury. There was, however, a telltale diminution in caliber of the inferior nasal and the superior temporal arteries. In addition to the localized variations in

caliber of the retinal arteries there is often a generalized attenuation. The vessels so affected are often straight, instead of being curved, as in the normal eye, and usually give off their branches at an acute angle. These attenuated vessels are often found to have walls that are thinned rather than thickened. Nipping of the vein alone is not sufficient ground for the diagnosis of retinal arteriosclerosis and, since the sclerosis is essentially patchy and may not affect the portion of artery crossing the vein, its absence is also of no great significance.

**Asbestosis Body.**—Gloyne states that from the presence of the asbestosis body in the sputum the following deductions can be made: 1. Since these typical bodies have not been found in any other disease, their presence is an indication of exposure to asbestos dust. 2. The fact that the bodies have not been found in asbestos dust implies that their formation is the result of some tissue reaction in the body—probably a colloidal reaction in which the iron plays a part. 3. The presence of asbestosis bodies in the sputum means that asbestos fibers have been present in the lung for many weeks at least. 4. The presence of the asbestosis body implies a tissue reaction to the fiber, but it does not necessarily follow that this reaction is accompanied by fibrosis. On one occasion the author found fine connective tissue fibers in sections of a guinea-pig as early as twelve days after subcutaneous inoculation of asbestos fibers, but the amount was minute. A heavy dose of fibers would be needed—and even then years might elapse—before the fibrosis was sufficient to be detected by physical signs or roentgen examination or to produce dyspnea. It would be unsafe, therefore, to accept the presence of the asbestosis body as undeniable evidence of fibrosis; all one can say at present is that the asbestosis body is an expression of tissue reaction of the nature of a benign irritant, and that fibrosis of an appreciable extent may or may not be a part of that tissue reaction.

## Medical Journal of Australia, Sydney

**1:** 755-784 (May 28) 1932

E. H. Embley Memorial Lecture. W. A. Osborne.—p. 755.
Two Groups of Atypical Dysentery Bacilli. Margot McKie and F. M. Burnet.—p. 760.
*Significance of "Slow Dulcite Fermenters" in Summer Diarrhea. W. T. Nelson.—p. 763.
Radium Implantation in Treatment of Capillary and Cavernous Nevi. C. C. Anderson.—p. 768.
Importance of Drainage in Renal Disease. R. K. L. Brown.—p. 769.
After-Results of Ethmoid Operation. H. G. Mitchell.—p. 772.

**1:** 785-814 (June 4) 1932

Anterior Poliomyelitis, with Especial Reference to Patients Passed Through the Royal Alexandra Hospital for Children in Recent Epidemics. J. Steigrad.—p. 785.
Principles of After-Care in Infantile Paralysis. E. B. M. Vance.—p. 789.
Prevention of Deformities in Treatment of Poliomyelitis. C. H. Hembrow.—p. 792.
Note on Significance of Dosage in Irradiation of Interrelated Tissues. W. H. Love.—p. 796.
Method of Drainage with Irrigation After Prostatectomy. J. Morton.—p. 798.
Scope and Utility of Gas-Oxygen Anesthesia. H. J. Daly.—p. 799.

**"Slow Dulcite Fermenters" in Summer Diarrhea.**—Nelson reports that the examination of large numbers of children in Melbourne suffering from diarrheal disease during the summer months has revealed a type of dysentery bacilli characterized by the slow fermentation of dulcite in peptone water sugar fermentation tubes. This strain has been found repeatedly since 1928 in the stools of children suffering from diarrheal diseases. During the summer of 1930 to 1931, it was isolated from the stools of 9 per cent of 122 patients with diarrheal disease examined in Melbourne. This strain resembled Bacillus flexneri in many ways but differed from it in (1) the appearance of the colonies on agar plates, (2) fermentation of dulcite, (3) no formation of indole, and (4) serologic reactions (agglutination and absorption of agglutinins). The type of illness affecting the children in whom it was found was a milder form of dysentery than that caused by Bacillus flexneri, for there were no deaths; while of the patients suffering from dysentery due to Bacillus flexneri, 16.6 per cent died. Pathogenicity for human beings tends to be confirmed by the development of agglutinins in patients' serums and by the absence of the well recognized types of dysentery bacilli from the stools. Some evidence of pathogenicity for laboratory test animals is given.

## Practitioner, London

**129:** 1-208 (July) 1932

*Observations on Gastric and Duodenal Ulcers. Moynihan.—p. 4.
*Infections of Hands and Fingers. J. Fraser.—p. 18.
Treatment of Pleurisy. R. A. Young.—p. 33.
*Seasonal Hay Fever. F. A. Knott, C. Gill-Carey and A. F. Hurst.—p. 45.
*Indigestion. S. W. Patterson.—p. 57.
Constipation and Mechanical Laxatives. F. B. Parsons.—p. 70.
Diagnosis and Treatment of Some Common Intestinal Protozoal Infections. J. G. Thomson.—p. 84.
Lumbago and Allied Conditions. J. B. Mennell.—p. 95.
*Some Minor Ailments of Feet. H. Dodd.—p. 107.
Insomnia. A. Feiling.—p. 120.
Minor Mental Disorders. W. R. Brain.—p. 130.
Hypertension. B. Parsons-Smith.—p. 140.
Significance of Albuminuria and Treatment. G. Evans.—p. 152.
Cystitis. A. E. Roche.—p. 161.
Modern Treatment of Varicose Veins. R. H. Maingot.—p. 174.
Modern Treatment of Burns and Scalds. W. C. Wilson.—p. 183.

**Observations on Gastric and Duodenal Ulcers.**—Moynihan calls attention to the fact that it is far too often the custom to speak of gastric and duodenal ulcer as one and indivisible in causation, symptomatology and treatment. This is a grave mistake. The two diseases occur in different types of individual. The chemical constituents of the gastric juice are as a rule quite dissimilar; a close analysis of the clinical symptoms reveals subtle, but often quite clearly recognizable, distinctions; perforation and hemorrhage do not occur with equal relative frequency; carcinoma is not an uncommon terminal result in gastric ulcer—it occurs in less than one in a thousand cases of duodenal ulcer. The pylorus forms a sharp line of division between the two and is rarely transgressed by a duodenal ulcer, almost never by a gastric ulcer. The author believes that it is important to distinguish between acute and chronic gastric ulcers. Acute ulcers are commonly if not invariably associated with toxemia; an infection in the mouth, on the skin, in the appendix or elsewhere may be the primary cause of those minute shallow erosions of the stomach or duodenum which cause dyspepsia, hemorrhage or perforation. Hemorrhage and perforation, though themselves acute, are with few exceptions the evidence not of acute but of chronic ulceration which has assumed fresh activity. In a series of gastric ulcers observed over a period of twelve years it was found that in sixty-one cases in which death occurred from perforation, the ulcer was of the chronic type in sixty; in fourteen cases in which death occurred from hemorrhage, the ulcer was of the chronic type in thirteen. In the acute case the ulcer was a terminal condition associated with advanced disease, and hemorrhage was not the determining cause of death. In a similar series of cases of duodenal ulcer during the same period, this truth also held good; twelve deaths from hemorrhage all occurred in cases of chronic ulcer; in 117 deaths from perforation there were 109 cases in which the chronic ulcer had given way; in twelve cases acute ulcer was present; so that there were four cases in which both acute and chronic ulcers were found; in every one it was the chronic ulcer that had perforated.

**Infections of Hands and Fingers.**—Fraser summarizes the principles of treatment of nail infections as follows: Unless pus formation exists, it is a mistake to incise the parts; no real benefit is achieved, but on the contrary tissue spaces are opened up which may lead to an extension of infection. In the early stages, therefore, he contents himself with such conservative measures as the application of a narrow congestive bandage around the finger base, and the application of heat to the part through the medium of hot finger baths or hot fomentations, the former for preference. It may be that by these means the formation of pus is avoided. As soon as suppuration has occurred, it should be released by an appropriate incision. The part should be incised in such a way as to secure a sufficiency of drainage and yet preserve the future function of the tissue. In practice the detail is as follows: Suppuration at the eponychium is incised by a flap incision so designed that the integument overlying the nail root is uplifted so as to permit the introduction of a narrow rubber tissue drain. Pus formed at the nail edge is released by an incision parallel to the long axis of the nail but so placed as not to damage the protective cornified ridge. If suppuration is extending beneath the nail into the nail bed it is rarely necessary to remove the nail plate. Pus formed in this situation extends

slowly because of the physical resistance offered by the tissues, and if the progress of events is carefully observed a local release of pus is secured while the suppuration is still confined to a small area. To remove the entire nail plate while the pus formation is limited is a harmful and barbarous procedure, for not only is it unnecessary but it exposes fresh tissue to infection and may result in permanent disfigurement of the finger tip. In such cases the author removes by means of small, strong, sharp-pointed scissors that portion of the nail plate which overlies the pus collection. The after-treatment of nail infection implies the continuance of hot antiseptic finger baths, of hot fomentations in the intervals of bathing, and of congestion. As soon as the infection has subsided a mild astringent antiseptic, such as acriflavine hydrochloride 1:1,000, is an appropriate dressing.

**Seasonal Hay Fever.**—According to Knott and his associates, rhinologic opinion is sharply divided on the question of the importance of the nasal factor in the group of diseases represented by hay fever, asthma, and chronic vasomotor rhinitis. An increasing body of opinion favors the view that sinusitis, when present in these conditions, is purely a secondary effect of the hypersensitiveness and repeated attacks of edema, and bears no causal relationship to it. Others regard pathologic conditions of the mucous membrane and sinuses as important predisposing factors to the development of hypersensitiveness. Certainly it is obvious that a nose already obstructed by a badly deflected septum or by the congestion of chronic infection will withstand the edema of hay fever with more difficulty than a normal nose, and that a chronic irritation from infection may increase the local reaction and prevent successful desensitization.

**Indigestion.**—Patterson states that indigestion may follow faulty habits, organic disease of the digestive tract or functional derangements of its secretory or motor mechanisms. Perhaps the commonest cause in everyday life of discomfort after meals is the bad habit of hurrying over meals, chewing the food incompletely or swallowing large boluses. Gulps of air are swallowed with hurriedly taken food and drink, and give rise to distention and flatulence. The practice of taking solid food and fluids separately is a simple but often successful means of prevention. The teeth should be examined, and those found to be painful or infected removed and adequate dentures supplied. Pus swallowed from infected teeth and gums, tonsils and accessory nasal sinuses will readily set up an atonic gastritis leading to indigestion. Alcoholic gastritis may be diagnosed readily when kept in mind. A common cause of indigestion nowadays is the recourse to acetylsalicylic acid and other coal-tar drugs for headaches, muscular pains and fatigue.

**Minor Ailments of Feet.**—Dodd concludes his review of minor ailments of the feet by mentioning the condition of pied forcé, which manifests itself by chronic discomfort and later moderate swelling over the shaft of the second or third metatarsal. Clinically and roentgenologically it may strongly suggest a fracture with a very mild reaction. After overuse of feet unaccustomed to strain, as in army recruits and enthusiastic hikers, a fracture of the shaft occurs quietly, without particular incident or pain. Early during the war, a battalion in France had two hundred men "confined to barracks" by "hysterical flat feet." A surgeon who saw some of them advised roentgen examination, and ultimately numerous cases of pied forcé were revealed, caused by long route marches with full packs during intensive training. Treatment consists in supporting the feet adequately in a stout plaster or boot until roentgen examination shows sound bony union. This condition may account for a few of the cases of obstinate pain in the feet, which are cropping up at present as the result of "overhiking."

## South African Medical Assn. Journal, Cape Town

**6:** 359-386 (June 11) 1932

Record of Five Hundred and Sixty-One Consecutive Autopsies on Native Mine Workers. W. O. Fischer.—p. 359.
Hoarseness. H. Lewis.—p. 362.
Treatment of Dementia Paralytica with Protein Shock, Tryparsamide and Spirobismol. B. J. F. Laubscher.—p. 366.
Diagnostic Value of Radiologically Filled Appendixes. H. D. M. Ackermann.—p. 374.

## Archives des Maladies de l'Appareil Digestif, Paris

**22:** 601-712 (June) 1932

*Supramesocolic Deformities of Duodenum in Form of "M." J. Quénu and C. Jacquelin.—p. 601.
Physiologic Studies of Stomach Following Ligation of Principal Arteries. E. Brenckmann.—p. 625.
Acid-Base Equilibrium of Urine. Chatron.—p. 637.

**Deformities of Duodenum.**—Quénu and Jacquelin designate as M shaped duodenum that deformity of the mobile duodenum which has been variously described as redundant duodenum, curved duodenum, angulated duodenum and so on, and which seems to result from the lengthening and sagging of the second portion of the duodenum in its supramesocolic segment. They report seven cases which illustrate different stages in the evolution of the deformity ranging from a simple duodenal inflexion forming an M, without localized dilatation or stasis in the joint of the inflexion, to the stage in which dilatation is at a maximum and the two median downstrokes of the letter form a large basin which empties into the remainder of the duodenum only by regorgement. In most of the cases there existed together with the deformity and disorders of the supramesocolic transit a dilatation immediately above the mesenteric crossing and a certain degree of stasis at this level with exaggerated antiperistalsis. A lengthening of the stomach with ptosis of the lower portion was also found in most of the cases. Discussing clinical manifestations, the authors remark the early appearance of digestive disturbances in adolescence or even childhood, which speaks in favor of the congenital nature of this deformity. The dyspeptic disorders, however, almost never present an acute character as in duodenal stenosis of rapid formation. They call attention to the difficulty experienced by the surgeon in finding exactly the deformity indicated by roentgenography. Medical treatment, such as employed in incomplete stenosis, usually suffices for the cure of M shaped duodenum. Surgical intervention is indicated clinically by aggravation of pain, frequent vomiting, paroxysmal crises, and decline of the general condition, and roentgenologically by the degree of sinking and dilatation of the duodenum and above all by the severity of the duodenal and retrograde gastric stasis. The intervention consists in suppression of the duodenal stasis by transmesocolic duodenojejunostomy. If the duodenal stasis is accompanied by gastric stasis, gastrojejunostomy must also be undertaken. The latter should be performed first and at a higher point on the jejunum than the duodenojejunostomy.

## Schweizerische medizinische Wochenschrift, Basel

**62:** 617-636 (July 2) 1932

*Pseudodementia Paralytica Following Carbon Monoxide Poisoning. A. Meyer.—p. 617.
*Cutaneous Symptoms in Sodium Chloride Retention. F. Jäggi.—p. 618.
Elimination and Iodometric Determination of Citric Acid in Urine. H. Süllmann and E. Schaerer.—p. 619.
Double Hearing in Epidemic Encephalitis. J. S. Galant.—p. 621.
Objective Electrical Demonstration of Existence of Emanation from Living Human Body and Its Visible Actions. E. K. Müller.—p. 622.

**Pseudodementia Paralytica Following Carbon Monoxide Poisoning.**—Meyer reports the history of a woman in whom three weeks after acute poisoning with carbon monoxide there developed, following an initial agitation, a condition resembling a syphilitic dementia paralytica, which took an acute course and ended fatally within four weeks. The pathogenesis of the dementia paralytica-like course of carbon monoxide intoxications has not been explained as yet. It has been assumed that the primary cause of the process is a nutritional disturbance, but why some cases end in recovery and others show progressive exacerbation even after they first manifest a tendency to a favorable outcome is still unexplained. The theory that the primary nutritional disturbance leads to chemical changes with varying toxic effects only describes the lack of knowledge. However, the author calls attention to investigations which revealed that the primary process in carbon monoxide poisoning is a paralysis and dilatation of the vessels. This leads to stasis of the blood that is impaired by the absorption of carbon monoxide. Secondarily there develops a disintegration of nervous elements, as could be ascertained in cases with slow lethal course. Most susceptible seem to be the cells of the pallidum; then follow the layers of the cerebral

cortex and the cerebellar cortex. The scars in late cases resemble perivascular foci of obliteration and gliosis as found in arteriosclerosis. This seems to indicate that perhaps existing arteriosclerotic or syphilitic vascular changes predispose to a severe course of carbon monoxide poisoning.

**Cutaneous Symptoms in Sodium Chloride Retention.**—Jäggi relates that he observed several patients with acute or with progressive cutaneous symptoms such as urticaria, eczema and prurigo, in whom serologic examination revealed a retention of sodium chloride or of chloride, but the protein content and the urea content were not increased. The main reason why these patients asked medical advice was intense and sometimes unbearable itching which was especially severe toward evening. The sodium chloride retention was accompanied by water retention, and especially noteworthy was the complete failure of the perspiratory function. The blood pressure was normal in all patients, and the composition of the urine was likewise normal. A diet deficient in sodium chloride and mostly lactovegetarian effected a rapid disappearance of the manifestations. That the intake of protein does not have an injurious effect was demonstrated in an experiment. Since the dietary treatment is simple and gives rapid results, other measures are not necessary; but the author thinks that diuretics may accelerate the therapeutic effect.

## Morgagni, Naples

**74:** 857-888 (July 3) 1932

*Morphologic Aspects of Endocrine Organs Under Influence of Sudden Hyperglycemia. M. Mattioli.—p. 859.
Practical Utility of Complemental Operations of Hysterectomy in Cancer. F. Lobello.—p. 867.

**Morphology of Endocrine Organs Under Influence of Hyperglycemia.**—Mattioli reports his observations after injecting dextrose and epinephrine into dogs. Histologic examination reveals an increase in the number and size of the islands of Langerhans in the pancreas, a great prevalence of acidophilic cells in the anterior lobe of the hypophysis and extreme hyperplasia in the cortical portion of the suprarenal and in the parathyroid. There are few or no histologic modifications in the medulla of the suprarenal and in the thyroid. Except for a mild hyperplasia in the endocrine part of the pancreas, the modifications do not occur when insulin is administered in addition to the dextrose. This all the more confirms the concept of the great importance of the islands of Langerhans in glycoregulation. The author concludes that the endocrine tissue of the pancreas is the principal factor in the mechanism of glycoregulation; the participation of other endocrine organs should always be considered as secondary in relation to the endocrine portion of the pancreas.

## Prensa Médica Argentina, Buenos Aires

**19:** 117-180 (June 20) 1932

Roentgen Examination of Pleural Cavity After Injection of Iodized Oils. A. A. Raimondi and M. Albertal.—p. 117.
*Ascending Neuritis Cured by Sympathectomy. J. Diez.—p. 123.
Action of Sodium Chloride and Magnesium Sulphate on Experimental Polyuria. A. Bergman.—p. 132.
Cardiovascular System in Relation to Endocrinology. P. M. Barlaro.—p. 143.
Normal and Pathologic Anatomy of Neck of Bladder. A. Trabucco.—p. 147.
New Model of Atraumatic Needle for Inserting Catgut Sutures. C. Castaldo.—p. 171.

**Ascending Neuritis Treated by Sympathectomy.**—Diez states that ascending neuritis is cured immediately and permanently by sympathectomy. He reports a case of typical ascending neuritis of the left arm, of twelve years' duration. The patient obtained immediate relief and permanent recovery by the resection of the stellate and middle cervical ganglions, with resection also of the ramus internodialis corresponding to these ganglions. The patient regained her working capacity almost entirely. When she was observed a year and a half after the operation had been performed, the satisfactory results still persisted. The author's case is the fifth reported in the literature in which ascending neuritis has been cured by an operation on the sympathetic nervous system. The author discusses the etiopathogenesis and physiopathology of the disease. The symptomatology and evolution of ascending neuritis are well known. Although there are not, up to the present time, precise data on the etiopathogenesis of the disease, the theory of a chronic and attenuated infection, progressing centrad to greater nerve trunks, through the neurilemma, proves to be correct. The theory that ascending neuritis is a sympathetic neuritis is based on the assumption of a peripheral sensory action of the sympathetic nervous system, which action is not proved. If the sympathetic nervous system had a direct action on the peripheral sensibility, the cutaneous hyperesthesia which follows ganglionectomy would affect the entire member corresponding to the suppressed sympathetic fibers, which is not the case. The sympathetic fibers, because of their relation with the spinal nerve fibers, are in some form involved in the production of the painful syndrome of ascending neuritis, in the determination of which, however, they do not have any part. The painful syndrome is a reaction of the spinal nerve fibers against the injury of their roots by a schwannoma formed at the distal end of the resected rami communicantes. The cutaneous hyperesthesia is entirely radicular. Since the cutaneous hyperesthesia is not of a peripheral but of a radicular origin, it is only logical to assert that the spinal roots also determine the pain provoked by the mechanical stimulation of the ganglions of the sympathetic nervous system. In other words, the peripheral pain caused by the stimulation of the ganglions of the sympathetic chain is the typical reproduction of the phenomenon of cutaneous irradiations of visceral pain described by Head and Mackenzie. The term sympathetic neuritis is improperly used, since it has been proved that ascending neuritis is a neuritis of the spinal system. The resection of the stellate ganglion cured the ascending neuritis by an indirect mechanism, by the production of vasodilatation, which (by increasing the circulation in the affected member) has a favorable action on the inflammatory condition of the neurilemma, since increased circulation has in general a favorable action on inflammatory conditions. The author says that, in order to make the indications for operation on the sympathetic nervous system more precise, it is advisable to obtain a thorough knowledge of the normal physiology of the sympathetic nervous system as well as of the physiopathologic changes caused by sympathectomy.

## Archiv für Dermatologie und Syphilis, Berlin

**165:** 495-816 (July 2) 1932

Spodogram of Oral Mucous Membrane. F. Herrmann and E. Eicken.—p. 495.
Chemical Studies on Human Skin. A. Nadel.—p. 507.
Water Test in Various Forms of Eczema and of Dermatitis. A. Perutz and A. E. Klein.—p. 525.
Colloid Osmotic Pressure in Various Forms of Eczema and of Dermatitis. A. Perutz and A. E. Klein.—p. 532.
*Persistent Complement Fixation and Cure of Gonorrhea. H. Fröhlich and P. Jordan.—p. 542.
Epidermophytosis of Nails Caused by Kaufmann-Wolf Fungus. A. Matras.—p. 552.
Tumor-Like Proliferations of Gingiva. A. Matras.—p. 565.
Idiopathic Multiple Sarcoma (Kaposi). H. Mierzecki.—p. 577.
*Symptomless Syphilis Infection of White Mice. C. L. Karrenberg.—p. 585.
Predisposition in Psoriasis. Bettmann.—p. 694.
Etiology of Pseudoxanthoma Elasticum (Darier). E. Joffe and M. Joffe.—p. 713.
Immune Reactions in Oidiomycosis of Skin in Human Beings and in Animal Experiments. H. Biberstein and S. Epstein.—p. 716.
Involvement of Rectum in Gonorrhea in Women. O. Dahmen.—p. 743.
Aspects of Erythema Annulare Centrifugum (Darier). S. Neumark.—p. 748.
Classification of Metaplasias with Especial Consideration of Epithelial Desmoplasia. J. Follmann.—p. 772.
Biology of Gonococcus. A. Cohn.—p. 790.
Fibrosarcoma of Skin. W. Bruck.—p. 797.
Aspects of Prurigo Nodularis (Hyde) and Its Relation to Keratosis Verrucosa (Weidenfeld). R. M. Bohnstedt.—p. 808.

**Persistent Complement Fixation and Cure of Gonorrhea.**—Fröhlich and Jordan report studies which show that a positive complement fixation reaction frequently persists for several years and that therefore it does not necessarily prove the existence of a latent focus of gonorrhea. The practical conclusion they arrive at is that gonorrhea can be declared cured only on the basis of a bacteriologic examination. If several bacteriologic tests of the various secretions have given negative results, a positive seroreaction may be disregarded. However, if there is some doubt about the exactness of the bacteriologic tests, a positive seroreaction facilitates the recognition of cases not yet completely cured. In these cases a

gonorrheal prostatitis frequently exists, but the authors think that gonorrheal foci of a different localization are rarely detected by the complement fixation reaction. They consider it advisable to subject every gonorrhea patient who has had a prostatitis to a complement fixation test six months and twelve months after completion of the treatment; if complement fixation persists, the secretions of the adnexa should be bacteriologically examined.

**Symptomless Syphilis in White Mice.** — Karrenberg's extensive report presents clinical, histologic, biologic and serodiagnostic data which he obtained in studies on approximately 700 animals. In summing up his observations he states that syphilitic infection in white mice is symptomless, at least as far as it can be ascertained by macroscopic observation. Even infection with large doses does not produce manifestations of disease. However, a symptomless infection of mice is possible by various methods; the only requirements are a certain minimum dose of virus and a sufficiently long contact between the virus and the organism. A connection between the quantity of the virus and the rapidity of infection is not demonstrable. In regard to the detection of the symptomless infection, it is stated that the serodiagnostic methods are practically valueless. At the site of infection the pathogenic organisms are demonstrable for various lengths of time. By means of staining they are longer demonstrable than in the dark field. Outside of the implant it is never possible to demonstrate spirochetes either by means of staining or by the dark field method. The lymph nodes of mice show in syphilitic infection about the same changes that are found in rabbit and in human syphilis. As indicated in biologic experiments, they become involved quite early and remain a virus reservoir. Histologic examination of the lymph nodes reveals no signs indicative of a syphilitic infection; however, in many instances a nonsyphilitic intumescence of the lymphatic apparatus is observable. The spleen and liver likewise become involved quite early and remain infectious for considerable periods, but histopathologic changes are absent. Although, in syphilis of rabbits, Spirochaeta pallida does not enter the brain, this does take place in mice. Moreover, the spirochetes that enter the brain of mice may become neurotropic in that, when they are reinoculated into rabbits, they have a tendency to enter the brain of rabbits. Macroscopic and microscopic examinations of lungs and kidneys reveal no involvement of these organs.

## Archiv für klinische Chirurgie, Berlin

**171:** 1-216 (June 22) 1932

Basis and Progress of Secretion Urography. A. von Lichtenberg.—p. 3.
Origin and Development of Chromocystoscopy. E. Joseph.—p. 29.
*Bronze Phlegmon (Gas Phlegmon) After Renal Operation. A. W. Meyer.—p. 39.
*Relation of Renal Capsules to Each Other and to Parenchyma. O. Orth.—p. 45.
Hemorrhagic Cysts of Suprarenal. G. Brandt.—p. 57.
Polyuria and Renal Insufficiency in Chronic Retention of Urine Due to Prostatic Hypertrophy. O. Hennig.—p. 66.
Posttraumatic Renal Calculi. J. Volkmann.—p. 86.
Renal Function in Acute Complete Occlusion of Ureter. H. Boenninghaus.—p. 109.
*Continuous Renal Drainage in Postoperative Treatment of Infected Calculous Kidney. R. Mutschler.—p. 116.
Papillomatosis of Renal Pelvis and Ureters. H.-U. Nommel.—p. 123.
Resection of Sigmoid Flexure with Murphy Button. A. W. Meyer.—p. 130.
Motor Mechanism of Stomach: Pyloric Reflex. W. Budde.—p. 136.
Gastrocolic Fistula After Gastro-Enterostomy. H. M. Hinrichsen.—p. 149.
Thrombophlebitic Splenic Tumor. F. Klages.—p. 157.
Unusual Aneurysm Formation of Common Iliac Artery Appearing Seven Years After Trauma. O. Hennig.—p. 175.
Paralysis of Sphincter Ani and Sphincter Vesicae in Disease of Douglas Pouch. O. Hennig and A. Schweizer.—p. 181.
Cystic Tumors of Pelvic Region. Brandt and F. Klages.—p. 186.
Treatment of Wounds by Acidification. W. Wagner.—p. 196.
Surgical Therapy of Frequently Recurring Dislocation of Patella. G. Brandt.—p. 204.
Surgical Elongation of Tibia at Distal End in Complete Paralysis of Foot in Children. F. Loeffler.—p. 210.

**Bronze Phlegmon After Renal Operations.** — Meyer describes a type of gaseous phlegmon which he has observed as a complication of renal operations and which he calls bronze phlegmon because of the large bronze-colored spots which appear near the incision. The clinical picture starts with a rise of temperature within twelve hours after operation and a slight tension and reddening visible only to the experienced eye. Within twenty-four hours, bronze spots appear 5 to 10 cm. from the incision. The patient complains of tension pains; the pulse declines. On opening the wound one finds a brownish discoloration of the musculature; it is bloodless and gas bubbles rise from it. If the wound is not opened at this time, the phlegmon develops rapidly, accompanied by a circulatory collapse, sudden anuria and intestinal paralysis; the rest nitrogen may rise to 150 mg. The author reports two cases of extirpation of the kidney and two pyelotomies performed with strict asepsis in which bronze phlegmons developed. The content of the renal pelvis was sterile in three of the cases and the catgut was sterile in all cases. The author has observed gas phlegmons only in patients with adhesions of the renal pelvis and thinks the anaerobic organism causing the infection must be latent in these perirenal adhesions. These cases show that the wound should be left open in renal operations, even simple pyelotomies, if adhesions are found. A tampon should be inserted into the wound and wire sutures applied to the deep musculature, which are not tied until after a few days. If the wound is closed at operation, careful examination must be made the same day. If there is the slightest tension or redness around the wound or a rise in temperature, examination should be repeated the next day and if any of the symptoms of gas phlegmon exist, especially bronze spots, the wound should be opened immediately.

**Relation of Renal Capsules to Parenchyma.**—In experimental investigations of the relation between the parenchyma, the fibrous capsule and the adipose capsule of the kidney, Orth injected dye into the renal parenchyma and capsule in thirty animals. The dye injected into the fibrous capsule remains in it and never enters the renal parenchyma but does spread toward the adipose capsule. In injection of the parenchyma, a part of the dye goes into the parenchyma and outward toward the capsule. If the injection is made deeper in the medulla, the dye also goes toward the hilus into the lymph nodes located there. A part of the dye is taken up by cells, at first mostly by leukocytes, later mostly by connective tissue cells. A certain affinity between the epithelial cells of the kidney and the abundance of cells in the inner layer of the capsule probably takes part in these procedures. From these experiments several practical conclusions may be drawn. Abscesses of the adipose capsule almost never penetrate into the renal parenchyma; the fibrous capsule in a certain sense constitutes a protective barrier. Storage of dyes takes place in the cortex, and the capsule and also passes over into the adipose capsule. This applies also to the spread of bacteria by the intravenous route. A primary suppuration of the adipose capsule with secondary participation of the kidney may exist, but the spread of suppuration from the kidney to the adipose capsule is more certain. Even the latter is not a frequent occurrence, according to the author's observations.

**Continuous Drainage in Postoperative Treatment of Infected Kidney.** — Mutschler thinks that continuous direct renal drainage with regular systematic irrigation of the kidney is an easier and more effective way of combating infection after operation on an infected calculous kidney than the customary method. Drainage in two directions permits a more thorough cleansing of the renal pelvis and removal of inflammatory products, which play an important part as crystallization centers for recurrent formation of calculi. In the majority of his cases, drainage was accomplished through the renal parenchyma. Mechanical cleansing was combined with an acidification therapy aimed at inhibiting the growth of bacteria by production of an acid urine. Dilute hydrochloric acid was administered locally and also orally. Irrigation, starting with 1 or 2 cc. and gradually increased to 20 cc., was given from two to three times daily. The common urinary disinfectants were also extensively used. Treatment lasted between two and three months and one and two years and was usually continued at home after the first four or six weeks. This method can be used in all cases of renal lithiasis in which conservative operation can still be carried out. The therapy is most successful in cases presenting congestion of the kidney, moderate enlargement of the renal pelvis and retention of urine. In cases of bilateral renal lithiasis, this treatment can be used on the kidney operated on first and the degree of recovery used

to determine the time for the second operation. No disturbances have been noted as a result of continuous drainage. In the majority of cases a pronounced improvement of the urine and the renal function was observed. There was only one recurrence. It is too early for a final judgment of this therapy.

## Deutsche medizinische Wochenschrift, Leipzig

**58:** 1117-1156 (July 15) 1932

Medicine and Psychology. A. Liebert.—p. 1117.
Latent Injury of Liver. H. Kalk.—p. 1119.
*Diagnosis of Perinephric Abscess. A. Vogl.—p. 1122.
*Kehrer's Sign as Symptom of Brain Tumor. R. Brennscheidt.—p. 1124.
Diagnostic Significance of Sugar in Cerebrospinal Fluid. G. Straube.—p. 1125.
Injuries of Eyes in Roentgen Therapy of Extra-Ocular Disturbances. W. Rohrschneider.—p. 1126.
Cultivation of Gonococci from Secretions That Have Been Sent In. P. Jordan.—p. 1128.
Determination of Cure of Syphilis by Means of Animal Tests with Material from Lymph Nodes. J. Hämel.—p. 1130.

**Diagnosis of Perinephric Abscess.**—Vogl shows that if a perinephric abscess is thought of, its diagnosis is not difficult, for in all cases of his own observation it was recognized during the first examination. The symptoms are few but characteristic. The main symptom is the deep painfulness in the renal region, which is detected by a short, firm blow on the lumbar musculature. Examination of the urine gives negative results, but fever and leukocytosis are always high. If the previous history reveals furuncles and other cutaneous suppurations, this is also a significant factor. Early diagnosis of the perinephric abscess is significant because it makes an early operative treatment possible, which in turn leads to rapid recovery. Spontaneous recovery is rare and should therefore not be relied on. In septic cases that are not quite clear, the paranephric abscess must be looked for. Since the subjective symptoms are either slight or entirely absent, localization of the abscess is difficult and usually is possible only by renal succussion. Patients in whom the abscess perforates early into the costovertebral angle or into the trigonum lumbale generally consult the surgeon on account of the visible swelling and fluctuation, but, in the great majority of cases in which the perinephric abscess becomes manifest as an indistinct febrile condition, the recognition by the practitioner is of great importance.

**Kehrer's Sign in Brain Tumor.**—Brennscheidt calls attention to Kehrer's sign, which, since he has watched for it, he has observed in all cases of cerebral tumor. The sign is a typical reaction of the patient to pressure on the so-called deep occipital point, which corresponds to the point of exit of the greater occipital nerve. As a result of the pressure the patient feels a severe pain at this point and, in order to escape it, he jerks his head backward and to the side, at which the pressure is exerted. In evaluating the symptom, Kehrer puts more stress on the flight movement than on the sensation of pain. The author asserts that occasionally the sign is an early symptom; that is, it is elicitable before other signs of cerebral tumor (choked disk and retardation of pulse) become manifest. A case of which the clinical history is given is noteworthy because in spite of the decompressive trepanation, and although choked disk was absent, Kehrer's sign was clearly perceptible. Following ventricular puncture it was less noticeable, and after operative removal of the tumor it disappeared entirely.

## Deutsche Zeitschrift für Chirurgie, Berlin

**236:** 381-484 (June 23) 1932

Testing of Substances Administered to Improve Regeneration of Bones. W. Felix, N. Synodinos and M. Jasdi-Sadeh.—p. 381.
Goiter and Exophthalmic Goiter: Clinical and Experimental Investigations. E. Schneider.—p. 391.
Pathogenesis of Gastric Ulcers. L. Duschl.—p. 408.
*Postoperative Peptic Gastro-Intestinal Ulcer. L. Zukschwerdt and T. Eck.—p. 424.
Function of Stomach Operated on According to Billroth I. E. Beresow and N. Stern.—p. 465.

**Postoperative Peptic Ulcer.**—Zukschwerdt and Eck relate their observations in ninety-three cases of postoperative peptic ulcers. They found that roentgenoscopy and fractional withdrawal of the gastric contents make a definite diagnosis possible in nearly all cases. Perforation into adjoining organs is quite frequent, but the incidence of a colonic fistula decreases with the improvement of the diagnostic methods. The average interval between the operation and the development of the postoperative ulcer is eighteen months. On the basis of studies on the incidence of peptic ulcers after the different surgical methods, the authors give the following rules for the prophylaxis: 1. Only such surgical methods should be employed in the treatment of gastric and duodenal ulcers as effect a considerable limitation of the gastric secretion; that is, the extensive resection according to the first or second operation of Billroth. Among the ninety-three cases of peptic jejunal ulcer there were sixty-eight in which the resection would have been possible in the first operation, and thus the peptic jejunal ulcer probably could have been avoided. 2. Even ulcers that seem to be cicatrized should be resected. In two cases of this type the authors performed only a gastro-enterostomy in order to overcome the stenosis, but a peptic jejunal ulcer developed soon afterward. 3. At the anastomosis, a stenosis should by all means be prevented. For the gastro-intestinal anastomosis, the uppermost loop of the jejunum that can possibly be used should be employed. 4. All operations that result in prolongation of the chemical phase of the gastric secretion, such as exclusion of the pylorus, should be avoided. 5. If resection for exclusion is resorted to, the entire antrum and a large portion of the fundus should be removed, a procedure which the authors consider advisable only in case of duodenal ulcer; if this cannot be done, they recommend a jejunostomy as preparation for the radical operation. 6. All patients who have undergone a gastric operation should receive dietetic after-treatment and should be kept under observation for a considerable time after discharge from the hospital, so that, if a peptic jejunal ulcer should develop, it could be recognized and treated in the incipient stage, and severe complications (perforation or gastrocolic fistula) prevented.

## Deutsches Archiv für klinische Medizin, Berlin

**173:** 123-338 (June 27) 1932. Partial Index

Acute Myeloblastic Leukemia. V. Efremow.—p. 123.
Processes of Regeneration and of Pigment Metabolism in Pernicious Anemia and in Bothriocephalus Anemia Before and After Liver Therapy. L. Heilmeyer.—p. 128.
Studies on Colloid Osmotic Pressure. E. Kylin.—p. 164.
Anoxemia in Acute Poisoning with Arsenic Hydride. F. Löning.—p. 177.
*Hyperchromic Anemia in Chronic Disorders of Pancreas. H. Brugsch.—p. 199.
*Clinical Aspects and Pathologic Anatomy of Cystic Liver. M. Blum and W. Müller.—p. 206.
Atrioventricular Automatism in Rheumatic Carditis. I. Oettinger and W. Neslin.—p. 212.
Bilirubin and Blood-Cerebrospinal Fluid Barrier. N. Klein and S. Szentmihályi.—p. 234.
Action of Spices on Secretion of Gastric Juice. W. Heupke and E. Holländer.—p. 241.
Relation of Intraventricular Conduction Disturbance to Intensity of Conduction Stimulus. S. Fehér and J. Freundlich.—p. 256.
Reduction Capacity of Sugar-Free Urines. F. Pendl.—p. 263.
Heredity of Blood Groups in Pernicious Anemia. H. Horsters and W. Krohn.—p. 271.
Coronary Infarct and Pulmonary Edema. L. Hess.—p. 283.
*Raw Diet and Heat Regulation. K. Eimer and F. Kaufmann.—p. 314.

**Hyperchromic Anemia in Chronic Disorders of Pancreas.**—On the basis of reports in the literature and of two cases from his own observation, Brugsch concludes that anemias, frequently with increased color index and with increased blood regeneration, may develop in severe, chronic pancreatic disturbances with disordered external secretion of the pancreas. The clinical aspects of these forms of anemia resemble greatly those of pernicious anemia. True pernicious anemia may likewise follow chronic disturbances of the pancreas, and there is a possibility that in these cases the disorder of the pancreas is the inciting cause. By means of special methods of examination, slight functional disturbances of the pancreas are more often demonstrable in pernicious anemia than was formerly assumed. However, the pathologico-anatomic aspects are usually not characteristic.

**Clinical Aspects and Pathology of Cystic Liver.**—The clinical history reported by Blum and Müller is noteworthy because of the unusually large size of the cysts. The weight of the liver, including the contents of the cysts, was 16 Kg. Another unusual aspect was the absence of disturbances in the function of the liver during a long period of observation. The

patient reached the age of 83 years, and the changes in the liver could be traced back twenty-five years. This shows to what extent the organism is capable of adjusting itself to changes in the vital organs.

**Raw, Salt-Free Diet and Heat Regulation.**—Eimer and Kaufmann point out that it is generally assumed that, since in perspiration not only water but also sodium chloride is eliminated, the heat regulation of human beings can be adequate only if that which is lost is quickly replaced; that is, in addition to large quantities of fluids, considerable amounts of sodium chloride have to be taken. On the other hand, a person who does not add sodium chloride to his food, that is, one who lives on a diet that is deficient in sodium chloride, is supposedly less efficient in hot weather, because he does not have the amount of perspiration that is necessary for heat regulation. Contrary observations on persons living on a salt-free, raw diet, induced the authors to make comparative tests on the heat regulation and sweat secretion of persons receiving diets with high, with normal, or with low sodium chloride content. It was found that persons who received a sodium chloride deficient, raw diet tolerate the sweating bath generally better than others. The perspiration sets in later, the skin and body temperatures do not rise so high, the quantity of perspiration is less, and its percental as well as absolute sodium chloride content is lower. The decreased sodium chloride elimination in the perspiration, like the decrease in the sodium chloride content of the urine, indicates an adaptation of the organism to the decreased sodium chloride intake. However, it may also explain the functional improvement in the heat regulation in that it accelerates the evaporation of the sweat. Other possible causes of the improved heat regulation during raw diet may be increased elimination of heat by conduction and particularly by radiation. The latter may be due to a decreased water and sodium chloride content, or to a better blood perfusion of the skin (vasomotor heat regulation). On the other hand, protein deficiency, abundant mineral content (especially potassium), and the influence of the diet on the sympathetic nervous system may also be important factors.

## Klinische Wochenschrift, Berlin

**11:** 1129-1168 (July 2) 1932. Partial Index

Circulatory Processes in Traumatic and in Postoperative Shock. H. Schneider.—p. 1129.
Extra-Insular (Renal) Diabetes. G. Löhr.—p. 1134.
Urea Formation in Animal Organism. H. A. Krebs and K. Henseleit.—p. 1137.
*Hypoglycemia Following Experimental Roentgen Irradiation of Pancreas. A. Terbrüggen and H. Heinlein.—p. 1139.
Tests on Commercial Products for Content in Vitamins A and D. W. Heubner and K. Schübel.—p. 1142.
Intracerebral Inoculation of Monkeys with Chancroid Bacilli. W. Frei, S. Hellerström, E. Wassén and J. Wiese.—p. 1143.
*Emulsive Tendency of Serum During Gestation. H. Eufinger.—p. 1144.
Fluctuations in Size of Splenic Shadow in Roentgenoscopy by Means of Contrast Medium. S. Kadrnka and E. Martin.—p. 1147.
Experimental and Clinical Studies on Respiratory Blood Pressure Fluctuations. A. Schott.—p. 1150.
Alpha Oxidation of Fatty Acids. H. Fasold.—p. 1151.
Incidence of Sarcoma of Uterus. G. Unbehaun.—p. 1152.

**Hypoglycemia Following Irradiation of Pancreas.**—In experiments on rabbits, Terbrüggen and Heinlein observed that by means of roentgen irradiation of the pancreas a lethal hypoglycemia can be produced. In the excretory portion of the pancreas degeneration was noted, whereas the islands of Langerhans were well preserved or even hypertrophic. In lethal hypoglycemia the glycogen disappears completely from the liver, from the muscles and from other organs. However, if during the hypoglycemic condition large amounts of dextrose are administered, the hypoglycemic symptoms, such as convulsions, hypothermia and venous collapse, disappear, and glycogen accumulates in the liver and in the muscles. An atrophy of the fat tissues of various organs was likewise noted in the hypoglycemic condition; only Kupffer's stellate cells contained fat droplets. In the brain and in the other organs, manifestations of degeneration were absent but there was stasis in the capillaries. It is as yet not definitely decided whether in hypoglycemic conditions the reduced rapidity of the sugar metabolism influences the central nervous system directly, or whether the excessive quantities of insulin produce the central nervous symptoms indirectly by way of the vessels.

**Emulsive Tendency of Serum During Gestation.**—In order to find an explanation for the rapid increase in the fat tissues in certain physiologic and pathologic processes, Eufinger reasoned that in such conditions the body fluids contain substances that promote emulsification of fat with water, and that the absorption of fat mixtures with high water content by the subcutaneous tissues and by other organs is thus facilitated. He also reasoned that, in the sudden increase in fat tissues that in some women sets in during pregnancy and lactation, water retention plays an important part. He then describes tests that he made on 310 pregnant women. On the basis of these tests he concludes that with advancing pregnancy the emulsive capacity of the serum increases. This increase in the emulsive power he considers to be the result of qualitative and quantitative changes in emulsive substances, particularly in cholesterol. He also thinks that the increased emulsification capacity of the serum is perhaps one of the causes for the changes in the water economy and for the tendency to edema formation that are frequently observable in pregnant women.

## Münchener medizinische Wochenschrift, Munich

**79:** 1061-1100 (July 1) 1932. Partial Index

Psychopathic Constitution and Its Social Evaluation. O. Bumke.—p. 1061.
Coronary Sclerosis. E. Romberg.—p. 1065.
*Deep Phlegmon of Neck. A. Krecke.—p. 1068.
Erroneous Diagnoses of Vertebral Fracture: Importance of Early Roentgenoscopy to Avoid Wrong Diagnoses. M. Lange.—p. 1076.
Roentgenologic Diagnosis of Intra-Uterine Death of Fetus. O. Brakemann.—p. 1079.
Subphrenic Abscess Following Intestinal Injury by Dull Force. E. Nagelsbach.—p. 1082.
Formation of Renal Calculi. I. Traube, K. Skumburdis and V. Goldberg.—p. 1083.

**Deep Phlegmon of Neck.**—Krecke sums up his discussion of the deep phlegmon of the neck as follows: 1. The deep phlegman of the neck is located in the loose tissue between the vascular sheath and the cervical organs, which is shut off externally by the taut cervical fascia. 2. It is dangerous because it may lead to suppurative mediastinitis and, by producing an edema of the glottis, may be the cause of sudden death. 3. The surest sign of deep cervical phlegmon is the board hard infiltration of the side of the neck with only slight involvement of the skin. 4. The location of the pus is indicated by the greatest sensitivity to pressure but, on account of the taut fascia, fluctuation is nearly always absent and should not be waited for. 5. Deep phlegmon of the neck should be treated by prompt opening. Electric surgery is most suitable for this purpose.

## Wiener klinische Wochenschrift, Vienna

**45:** 833-864 (July 1) 1932

Significance of Local Anesthesia for Course of Local Laparotomy. H. Finsterer.—p. 833.
*Rare and New Forms of Leukoplakia Oris. K. Ullmann.—p. 840.
Processes in Deposition of Urinary Salts During Gout. G. Pommer.—p. 845.
Clinical Application of Freund-Kaminer's Intracutaneous Carcinoma Reaction. G. Marangos.—p. 848.
Parallergic Manifestations of Diphtheria Allergy. J. Siegl.—p. 851.
Diagnosis of Mastoiditis. G. Alexander.—p. 853.

**Rare and New Forms of Leukoplakia Oris.**—In enumerating rare forms of oral leukoplakia, Ullmann calls attention to those which occasionally develop after arsenic or after gold therapy and cites one case in which severe oral leukoplakia followed the therapeutic use of arsenic and of gold. He then discusses the leukoplakia that is caused by galvanic currents developing in the oral cavity as the result of the use of several kinds of metals in dental prostheses, such as amalgam fillings, gold crowns and metal clamps. The presence of two or of several metals in the acid oral secretion produces galvanic currents that are readily detectable with the micro-amperemeter. Although the currents are weak, their constant action represents a considerable irritation. Moreover, the metals gradually disintegrate and by this also irritate the oral mucous membrane. For the treatment and prevention of the changes caused by the galvanic irritation, the author recommends that amalgam fillings should be replaced by cement or porcelain and that metal clamps and prostheses should be made of the same type of gold alloy.

## Zentralblatt für Chirurgie, Leipzig

**59:** 1617-1664 (July 2) 1932

Evaluation of Biopsy in Bone Tumors. F. J. Lang.—p. 1618.
Operation in Diaphragmatic Hernia. C. Hammesfahr.—p. 1621.
Vascular Anesthesia. F. Härtel.—p. 1623.
Extirpation of Tumors of Paraganglion Caroticum. L. von Gidró.—p. 1624.
*Gastric Tuberculosis. A. Pop and M. Hanganutiu.—p. 1629.
Rupture of Inner Ligamentous Apparatus of Knee Joint with Simultaneous Detachment of Meniscus. W. Porzelt.—p. 1635.
Anatomic Localization of Shoulder Pain. A. Szubinski.—p. 1638.

**Tuberculosis of Stomach.**—Pop and Hanganutiu report a case of gastric tuberculosis and discuss the difficulty of differentiating between tuberculous and malignant gastric tumors. In roentgenologic examination of the patient, the stomach had the appearance of being amputated, as its horizontal portion was almost entirely lacking. This amputation ended with an almost linear contour. In the region of this lacunar border, a mobile resistance could be palpated. The barium was retained in the stomach after seven hours. On the basis of these and other clinical observations a diagnosis of pyloristenosis due to tuberculous or malignant tumor was made. Pylorogastrectomy was performed. Histologic examination of the resected portion of the stomach and of the perigastric tumors confirmed the tuberculous nature of the gastric picture revealed at laparotomy. From this case and four others previously reported the authors conclude that there are no roentgenologic criteria for differential diagnosis of tuberculosis of the stomach and cancer of the stomach, especially malignant stenosis. Tuberculosis of the stomach usually leads to tumor formation, which rapidly causes a stenosis that is curable only surgically. In malignant stenosis the constriction is produced by neoplastic infiltration of the pyloric wall. In this case the roentgenologic picture shows an amputation of the pylorus or a lacunar appearance of the curvatures. The lacunar appearance is caused by the borders of the tumors, which have irregular outlines. In tumor-like tuberculous pyloristenosis the roentgenologic picture is the same with the exception that the boundaries of the tumor have a straight outline; that is, the pylorus amputation is linear. Hypersecretion is always more pronounced in tuberculous than in cancerous pyloristenosis. This is because the course of tuberculous stenosis is a slow one. The infiltration of the stomach in all of the authors' cases did not end with the pylorus but extended to the duodenum, transforming it entirely or in part into a rigid tube. For this reason one should examine every pyloristenosis minutely, also making use of duodenoscopy. A duodenum with the appearance of a rigid tube points to tuberculosis, even if the clinical picture resembles malignant stenosis, as a carcinoma never extends to the duodenum.

## Zentralblatt für Gynäkologie, Leipzig

**56:** 1681-1744 (July 9) 1932

*Roentgenogram of Descending Urinary Passages During and After Pregnancy. H. Jacobi.—p. 1682.
Roentgenologic Simulation of Renal Calculus. W. Haase.—p. 1693.
Aspects of Hypernephroid Tumors, So-Called Aberrant Suprarenals. R. D'Accini.—p. 1694.
Course and Outcome of Implantation of Ureter into Intestine on Account of Puerperal Vesicovaginal Fistula. H. Katz.—p. 1698.
Endometriosis of Urinary Bladder: Case. G. Frommolt.—p. 1707.
Id. H. F. Eberhard.—p. 1712.
Foreign Bodies in Bladder and Their Removal. W. Rosenstein.—p. 1715.
Technic of Examination of Bladder in Complete Urethral Incontinence. B. Ottow.—p. 1719.
Irreversible Changes in Mucous Membrane and in Vessels of Urinary Bladder After Gynecologic Roentgen and Radium Irradiations. B. Ottow.—p. 1722.

**Roentgenogram of Urinary Passages in Pregnancy.**—Jacobi directs attention to the ureteral dilatation that during the second half of gestation is detectable by roentgenoscopy in nearly 80 per cent of pregnant women. As the main cause of this dilatation he considers the reduced tonus of the ureter, which is a partial manifestation of the general loss in tonicity characteristic for the period of gestation. Moreover, the enlarging uterus exerts pressure on the ureter and thus the ureter may even present the aspects of stasis. But as proof that the uterine pressure is not the only cause of the ureteral dilatation during pregnancy, the author cites the fact that in other space limiting processes, such as in the case of large tumors, dilatation is rarely observable. Pyelitis presents changes in the roentgenogram only in the most severe cases, and these pyelitic changes usually appear on the renal calices, and thus they differ from the physiologic pregnancy changes. The roentgenologic examination of women after confinement gives valuable information, because the ureteral dilatation that is a more or less physiologic aspect of pregnancy recedes simultaneously with the postpartal uterine involution or at least soon thereafter. The pyelitic changes, however, persist for longer periods, for after weeks and even after months the roentgenogram still shows a dilatation of the ureters. The conclusion that the author draws from this is that in women who have had pyelitis a new pregnancy must be prevented until all clinical and roentgenologic changes have disappeared.

## Jurnal Nevropatologii i Psikhiatrii, Moscow

No. 4, 1-88, 1931

Diencephalitis: Two Cases. N. P. Volokhov.—p. 11.
Deficiencies of Thalamencephalon: Diencephalitis. M. B. Khait.—p. 16.
Disturbance of Hemato-Encephalitic Barrier in Typhus Fever Complicated by Meningo-Encephalitis. V. M. Domrachev and D. T. Kuimov.—p. 23.
Semeiology of Ergotism. Maevskiy and Nikolskaya.—p. 29.
Dementia Paralytica with Schizophrenia: Case. A. E. Neiburg.—p. 34.
Unusual Depressive Psychosis Following Epidemic Encephalitis: Case. F. O. Kanevskaya.—p. 39.
Fear Symptom During Chronic Stage of Epidemic Encephalitis. S. I. Kharchenko.—p. 48.
Value of Buscaino Urine Reaction in Diagnosis of Nervous Diseases. V. S. Plyusnina.—p. 50.
*Hemato-Encephalitic Barrier in Schizophrenia: Permeability Coefficient with Walter-Hauptmann (Bromide) Method. E. Z. Gilbo.—p. 53.
*Prophylactic Therapy for Physical Deformities Following Acute Poliomyelitis. S. I. Uarovoy-Yakobson.—p. 59.
Beneficial Influence of Pioneer Work with Various Types of So-Called Psychopathic Children. T. Simson.—p. 69.

**Hemato-Encephalitic Barrier in Schizophrenia.**—In the study of the hemato-encephalitic barrier, Gilbo used the method of Walter-Hauptmann. Within a period of six days the patient received 150 cc. of a 7 per cent solution of sodium bromide. On the seventh day the blood and the cerebrospinal fluid were examined. The proteins were precipitated in the fluid and serum by trichloracetic acid and then to the filtrate was added several drops of a 1 per cent solution of gold chloride, which in contact with the bromine gave the solution a brownish-yellow color. The bromine content was determined colorimetrically. The ratio between the bromine in the blood and the spinal fluid was expressed as a coefficient of permeability. Among ninety-six patients with schizophrenia examined in this way, twelve were catatonic and seven were paranoiac forms. The author concludes that the hemato-encephalitic barrier in schizophrenia may be raised and lowered depending on the form of the disease. In catatonic forms there is a tendency for a decrease in the coefficient of permeability (PQ) and therefore an increase in the permeability of the barrier, while in paranoiac forms the coefficient of permeability is increased. During actively progressive states of schizophrenia the barrier is low, while in defective states it is high. When the disturbance has a tendency to remission, the coefficient of permeability is low.

**Treatment of Deformities Following Poliomyelitis.**—Uarovoy-Yakobson states that, in the absence of good and sufficient treatment in the presence of deformation and contracture, a disturbance in the function of one or several muscle groups following acute poliomyelitis may lead to complex static and dynamic disturbances. He cites eight personal observations of paralysis of the thigh muscles. Insufficient and incorrect treatment may be followed by flexion, pronation and rotation contracture of the coxalgic pelvis, flexion contracture of the knee joints, genu valgum, pes valgus, or pes equinovalgus, prolapsed pelvis in a paralyzed state and bent forward, scoliosis, and lordosis of the spine, as well as marked deviation from the static and the dynamic norm. The author believes that prophylactic treatment would be aided by a clearer understanding of the pathogenesis of deformation, contracture and static and dynamic disturbances. Kinesitherapy may be supplemented by orthopedic surgery.

No. 5, 1-113, 1931

Problems in Preparing Psychiatric Personnel. N. V. Zelenin.—p. 19.
Darwinian Methods in Study of Neuropathology. M. S. Skoblo.—p. 24.
Higher Cerebral Activity and Dialetic Materialism. G. V. Gerver.—p. 42.
Psychohygienic Consultation as Form of Psychoprophylaxis. B. D. Fridman.—p. 50.

Statistical Study of Epilepsy in Colonies and in Psychiatric Institutions of U. S. S. R. L. A. Prozorov.—p. 53.
Necessity for Study of War-Time Neurology. D. Futer.—p. 57.
Genetics and Hereditary Aspect of Neuropathology. S. N. Davidenkov.—p. 60.
*Clinical Aspect and Therapy in Neurogenous Form of Muscular Atrophy of Charcot-Marie. A. S. Pomerantsev.—p. 73.
Pathogenesis and Pathologic Anatomy of Multiple Sclerosis of Brain and Spinal Cord (Charcot's Disease): Case. V. V. Mikheev and N. I. Propper.—p. 81.
Functional Influence of Kidneys in Mental and Nervous Diseases. N. P. Volokhov.—p. 90.
Relationship Between Sensitivogalvanic and Psychogalvanic Reactions and Potassium and Calcium Contents of Blood: Part Played by Sympathetic and Parasympathetic Nervous Systems. I. K. Zyuzin.—p. 94.
Difficulty in Differentiating Epilepsy from a Purely Mental Disturbance: Case. I. N. Vvedenskiy.—p. 101.
Introduction to the Problem of Juridicopsychiatric Determination of Deviation from Sanity. A. N. Buneev.—p. 104.
Pathogenesis and Therapy in Multiple Sclerosis. V. V. Mikheev.—p. 109.

**Neurogenous Form of Muscular Atrophy of Charcot-Marie.** — Pomerantsev reports six personal observations of patients with a typical clinical picture of Charcot-Marie and with neurogenous atrophy of muscles. Some authors believe that the chief etiologic factor of this disease is an hereditary degeneration. Three of the patients were brothers, who reported that the disease had also affected a fourth brother; all were from 28 to 33 years of age. One patient was the daughter of first cousins (the author suggests a recessive factor of inheritance); another inherited the disease from her mother, while the sixth patient reported that this disease was an hereditary characteristic of many of the male members of the family. All the patients had articular disturbances which began in the peroneal group of muscles. Disturbances in reflex action depended on the severity of the articular insufficiency. Fibrillation was present in one instance, while vibration and deep sensation were other striking symptoms. There was a disturbance in the sympathetic nervous system and there were also changes in reaction of degeneration, which serve to distinguish myopathic from neuromyelopathic forms. The course of the disease was slow and did not prevent the patients from working. The treatment was the same as that incorporated in chronic degenerative polyneuritis; namely, complete rest in bed, baths, massage, individual gymnastics, rhythmic faradization and Bergonié's treatment.

## Hospitalstidende, Copenhagen

**75:** 717-744 (May 26) 1932

Three Cases of Pigmentation Anomalies of Nervous Origin. M. Ellermann and G. E. Schrøder.—p. 717.
*Results of Inguinal Herniotomy in Men. P. Nordentoft.—p. 731.
Treatment of Fracture of Condyle of Tibia. O. Kapel.—p. 737.
Case of Initial Filtrate with Transient Ring Shadow in Roentgen Picture. K. Andersen.—p. 741.

**Results of Inguinal Herniotomy in Men.**—Nordentoft's after-examinations from six months to nine years after operation in 449 cases of "typical" herniotomy show recurrence in 4.5 per cent; in the 358 cases of indirect hernia, recurrence appeared in 3.6 per cent, in the 91 with direct hernia, 7.7 per cent. The fewest recurrences were seen in the youngest age-group (from 15 to 30 years), otherwise the frequency of recurrence did not depend on age. Of the total 512 patients operated on, the mortality was 11, or 2.1 per cent; no deaths occurred after bilateral herniotomy, done in one sitting in 68 cases.

## Hygiea, Stockholm

**94:** 449-496 (June 30) 1932

*Peptic Ulcers in Meckel's Diverticulum. H. Wulff.—p. 449.
*Treatment of Gastric Ulcer and Duodenal Ulcer in First Medical Clinic. I. Holmgren.—p. 458.
Origin and Localization of Traumatic Rupture of Bladder in Connection with Observed Case. A. B. Sjövall.—p. 467.

**Peptic Ulcers in Meckel's Diverticulum.**—Wulff tabulates forty-two microscopically verified cases (including one personal case) of ulcers in Meckel's diverticulum lined with gastric mucous membrane. The condition, he says, occurs almost exclusively in children and younger persons and usually in males. Hemorrhages by the rectum, frequently marked, not infrequently a clear red, are the most common and often the only symptom in the history in ulcers in Meckel's diverticulum. In only two of the cases was diagnosis made before operation. With ulcers in this localization, roentgen examination does not seem to be of great value in diagnosis.

**Treatment of Gastric Ulcer.** — Instead of the hypoalimentation treatment of simple ulcers, Holmgren uses a suralimentation method. He has found that hemorrhages from ulcers which do not yield to the usual dietetic treatment cease on a more liberal diet; that the ulcer symptoms disappear as rapidly as they do on a stricter regimen, which was also the case with the roentgenologic niches, and that the time of convalescence is notably shortened.

## Ugeskrift for Læger, Copenhagen

**94:** 601-636 (June 16) 1932

*Orbital Phlegmons. J. Møller.—p. 601.
Determinations of Hemoglobin and Standardization of Hemometers. E. Lange.—p. 606.
Blood Types in Forensic Work in Medicolegal Institute: Review. K. Sand.—p. 610.
*Status of Problem in Application of Human Blood Types in Paternity Cases. O. Thomsen.—p. 615.

**Orbital Phlegmons.** — Møller reviews the diagnosis and treatment of orbital complications in sinus disorders, using the term orbital phlegmons as a convenient group designation without the involvement of orbital phlegmons in the stricter sense in all cases. Of the seven grave cases reported, the first, while presenting the same picture of edema of the eyelids as the others, resulted from a thrombosis of the cavernous sinus. The six cases were due to sinus disease that gave symptoms of an orbital phlegmon, three also with endocranial disorders which caused death. These cases represent the various complications which, according to the author, may be expected—subperiosteal abscess in the orbit, diffuse plegmon without the formation of abscesses, optic neuritis and other endophthalmic changes, meningitis, and brain abscess, together with more superficial gravitation abscesses.

**Human Blood Types in Paternity Cases.** — Thomsen states that the distinction between the two modifications of type A ($A_1$ and $A_2$) is necessary because in certain instances it allows the exclusion of a paternity which cannot be excluded if A is considered as an undivided entity. Since the $A_1$ factor dominates over the $A_2$, the latter may be hidden by $A_1$, while $A_1$ can never be hidden by $A_2$. In all cases in which the exclusion of paternity may depend on a latent $A_2$ receptor, such cases constituting about 6 per cent of all "blood type cases," the results must be accorded definitely less value than when the more stable $A_1$ and B receptors are concerned.

**94:** 661-680 (June 30) 1932

*Silicosis in Seventy-Eight Workers Exposed to Dust of Stone. S. V. Gudjonsson.—p. 661.

**Silicosis in Seventy-Eight Workers in Stone.**—Gudjonsson's examinations were made in persons employed in work with stone for from over two to over twenty-five years. Of the forty with silicosis, twenty-five had second stage silicosis. The origin of silicosis seems to depend directly on the length of employment, not on age. The total morbidity, particularly from pulmonary disease, has increased during recent years among the workers affected. Signs of pulmonary tuberculosis were found in four.

**94:** 681-704 (July 7) 1932

*Significance to Be Attached to Three Types of Tubercle Bacilli (Human, Bovine and Gallinaceous) as Cause of Tuberculosis in Man in Denmark. K. A. Jensen.—p. 681.
Sporadic Goiter of Genotypical Origin and Relation to Other Thyroid Disorders. C'td. J. Bing.—p. 688.

**Three Types of Tubercle Bacilli.**—Jensen says that the avian type of tubercle bacillus is of little significance as a cause of characteristic tuberculosis in man. Type determinations of forty strains in pure culture from various tuberculous conditions show that the majority of cases of pulmonary tuberculosis and of surgical tuberculosis, except tuberculosis of the lymph nodes of the neck and urogenital tuberculosis, are caused by bacilli of the human type and that most cases of tuberculosis of the lymph nodes of the neck are due to bacilli of the bovine type, as are also 19 per cent of the cases of urogenital tuberculosis, likewise 24 per cent of the cases of tuberculous meningitis (in children under 5 more than 50 per cent). Infection with the human type of tubercle bacilli seems to occur from man to man, open pulmonary tuberculosis being the preponderating source of infection; infection with the bovine type occurs almost exclusively from cattle to man, milk being the most active source of infection.